PWS MK1, MOD1 USER MANUAL

END USER MAINTENANCE MANUAL

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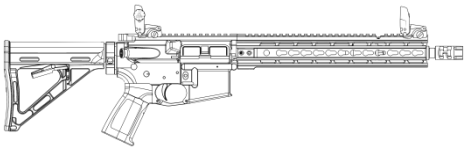
(M107RA1B)

RIFLE, .223 Wylde, MK110
(M110RA1B)



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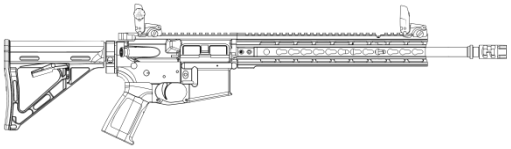

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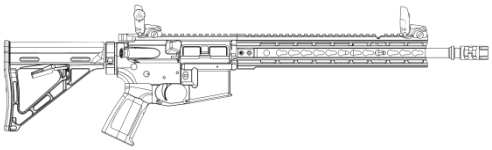
(M116RB1B)



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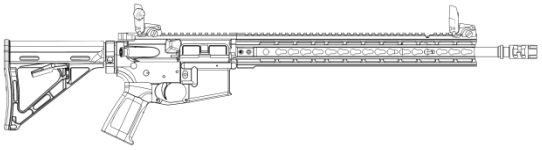

RIFLE, .223 Wylde, MK118
(M118RA1B)

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WARNING

ALL WARNINGS in this technical manual pertain to all versions of the rifles, carbines and uppers unless otherwise specified.

Prior to beginning an inspection, ensure the rifle is UNLOADED. DO NOT pull the trigger until the rifle has been cleared. Remove the magazine and inspect the chamber to ensure that it is empty and that a round is not chambered.

Do not keep live ammunition near work area.

To avoid injury, use caution when removing and installing spring-loaded components.

The bolt cam pin must be installed or irreparable damage will occur to the weapon and injury or death of personnel may result.

Cleaning solvents are flammable and toxic and should be used only in a well-ventilated area. The use of rubber gloves is necessary to protect the skin when washing rifle parts.

Avoid skin contact when using carbon removing compounds. If carbon removing compound comes in contact with the skin, wash thoroughly with running water. Using gloves and protective equipment is required.

CLEARING PROCEDURE

1. Point the muzzle in a designated SAFE DIRECTION.
2. Attempt to place selector lever on SAFE (If weapon is not cocked, lever cannot be placed on SAFE).
3. Remove the magazine by depressing the magazine catch button and pulling the magazine down.
4. Lock the bolt open by pull the charging handle rearward while pressing the bottom of bolt catch.
5. Ensuring the bolt carrier group is locked rearward, return the charging handle to full forward position.
6. If you have not done so before, place the selector lever on SAFE.
7. Visually (not physically) inspect the receiver and chamber to ensure these areas contain no ammo.
8. Drop the bolt closed.
9. Close the ejection port cover.

Unit and Direct Support Maintenance Manual
(Including Repair Parts and Special Tools List)
For

RIFLE, .223 Wylde, MK107
(M107RA1B)

RIFLE, .223 Wylde, MK110
(M110RA1B)

RIFLE, .223 Wylde, MK112
(M112RA1B)

RIFLE, .300 BLK, MK112
(M112RB1B)

RIFLE, .223 Wylde, MK114
(M114RA1B)

RIFLE, .223 Wylde, MK114 LE
(M114RA1BLE)

RIFLE, .223 Wylde, MK116
(M116RA1B)

RIFLE, .300 BLK, MK116
(M116RB1B)

RIFLE, .223 Wylde, MK118
(M118RA1B)

Current as of April 2013

CONTENT ADOPTED FROM US ARMY TM 9-1005-319-23&P

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SAFETY IS YOUR NUMBER ONE RESPONSIBILITY

Regardless of where you are the first concern of every firearm owner should be safety. Apply the following safety rules in every situation and with any kind of firearm. If you feel uncertain about any operational aspects of your firearm, please contact Primary Weapons Systems, Inc. (PWS) at (208) 344-5217 before proceeding with its operation.

SAFETY WARNINGS

YOU MUST FOLLOW ALL OF THESE SAFETY RULES TO ENSURE THE SAFE USE OF YOUR FIREARM. FAILURE TO FOLLOW THE INSTRUCTIONS AND WARNINGS IN THIS MANUAL COULD CAUSE SERIOUS PERSONAL INJURY OR DEATH TO YOU OR OTHERS AND DAMAGE TO PROPERTY.

As a gun owner, you accept a demanding responsibility and how serious you take this responsibility can be the difference between life and death. There is no excuse for careless or abusive handling of your fi rearm. Handle your fi rearm with intense respect for its power and potential danger.

ALWAYS KEEP YOUR FIREARM POINTED IN A SAFE DIRECTION
Never point a firearm at anyone or anything you do not intend to destroy whether or not it is loaded. This is particularly important when loading, unloading, or field stripping the gun.

ALWAYS control the direction of the firearm.

ALWAYS TREAT EVERY FIREARM AS IF IT IS LOADED AND WILL FIRE
Do not take anyone's word that the fi rearm is unloaded – always check for yourself. Never pass your fi rearm to another person until the cylinder or action is open and you visually check that it is unloaded. Keep your fi rearm unloaded and safely stored when not in use.

NEVER PLACE YOUR FINGER INSIDE THE TRIGGER GUARD OR ON THE TRIGGER UNLESS YOU INTEND TO FIRE
Ensure that other objects do not touch the trigger.

ALWAYS BE SURE OF YOUR TARGET AND WHAT IS BEYOND IT
Always be sure of where the bullet will strike and shoot only where there is a safe back stop free of obstructions, water or other surfaces which can cause ricochets. Be sure your bullet will stop behind your target. Bullets can ricochet and travel in unpredictable directions with considerable velocity. Do not fire randomly into the sky.

ALWAYS WEAR EYE AND EAR PROTECTION THAT IS SPECIFIED FOR USE WITH FIREARMS
Proper protective equipment should be worn every time you handle your fi rearm for purposes of discharging your fi rearm or for cleaning and maintenance. Ensure that others in the vicinity of where you are shooting also wear proper ear and eye protection.

NEVER USE ALCOHOL OR DRUGS BEFORE OR WHILE SHOOTING
Do not use your fi rearm if you are on any medication which impairs, even slightly, your mental or physical ability.

ALWAYS HAVE ADEQUATE VENTILATION
Discharging fi rearms in poorly ventilated areas, cleaning fi rearms, or handling ammunition may result in exposure to lead and other substances known to cause birth defects, reproductive harm, and other serious physical injury. Review the warnings and labels for all ammunition and cleaning products carefully. Wash hands thoroughly after exposure.

BEFORE HANDLING ANY FIREARM, UNDERSTAND ITS OPERATION
Not all fi rearms are the same. Familiarize yourself with the mechanical features of any fi rearm you intend to use. If you feel uncertain about any operational aspects of your PWS firearm, please contact PWS Customer Service at (208) 344-5217 before proceeding with its operation.

NEVER ALLOW A FIREARM TO BE USED BY INDIVIDUALS WHO DO NOT UNDERSTAND ITS SAFE OPERATION OR HAVE NOT READ THESE FIREARM SAFETY RULES ALWAYS USE THE CORRECT AMMUNITION FOR YOUR PARTICULAR FIREARM
Never use non-standard, reloaded, or “hand loaded” ammunition which has not been subjected to internal ballistic pressure testing.

BEWARE OF BARREL OBSTRUCTIONS
Be sure the barrel is clear of obstructions before shooting. Mud, water, snow or other objects may inadvertently lodge in the barrel bore. A small obstruction can cause a dangerous increase in pressure and may damage your weapon and cause injury to yourself and others.

ENSURE ALL ACCESSORIES ARE COMPATIBLE
Ensure that all accessories such as grips, slings, scopes and other accessories are compatible with the fi rearm and that the accessories do not interfere with safe operation. It is your responsibility to understand and follow all of the instructions in this manual, as well as those which may be supplied with your ammunition and any accessory.

NEVER DISASSEMBLE YOUR FIREARM BEYOND THE FIELD STRIPPING PROCEDURE OUTLINED IN THIS MANUAL
Improper disassembly or reassembly of your firearm may be dangerous and can lead to serious injury or death.

NEVER MANIPULATE, ADJUST OR CHANGE ANY OF THE INTERNAL COMPONENTS OF YOUR FIREARM UNLESS SPECIFICALLY INSTRUCTED TO DO SO IN THIS MANUAL
Improper manipulation of any other internal component may affect the safety and reliability of your fi rearm and may cause serious injury or death.

NEVER ALLOW ANY ALTERATION OR REPLACEMENT OF PARTS IN YOUR PWS FIREARM UNLESS PERFORMED BY A QUALIFIED GUNSMITH
Repairs or replacements should only be done by a qualified gunsmith using genuine PWS parts. If you do otherwise, improper functioning of your firearm may occur and serious injury or death and damage to property may result.

FIREARM USE WARNING:

SAFE USE OF A FIREARM IS YOUR PERSONAL RESPONSIBILITY AND THE FAILURE TO FOLLOW ALL OF THESE BASIC SAFETY RULES MAY RESULT IN SEVERE PERSONAL INJURY OR DEATH TO YOU OR OTHERS AND DAMAGE TO PROPERTY. YOU ARE THE MOST IMPORTANT SAFETY DEVICE WHEN IT COMES TO THE USE OF YOUR FIREARM AND PRIMARY WEAPONS PRIMARY WEAPONS SYSTEMS, INC WILL NOT BE RESPONSIBLE FOR ANY PERSONAL INJURY, DEATH OR PROPERTY DAMAGE THAT RESULTS FROM: (1) THE CRIMINAL OR NEGLIGENT USE OF THIS FIREARM; (2) A DISREGARD OF THESE SAFETY INSTRUCTIONS AND WARNINGS; (3) IMPROPER OR CARELESS HANDLING OF THIS FIREARM; (4) THE USE OF NON-STANDARD, DEFECTIVE, IMPROPER OR RELOADED AMMUNITION; OR (5) IMPROPER OR NEGLIGENT MODIFICATIONS OR REPAIRS TO THE FIREARM.

USED FIREARM DISCLAIMER:

BUYER AGREES TO HAVE ANY USED FIREARM CHECKED BY A CERTIFIED GUNSMITH PRIOR TO FIRING. BUYER ASSUMES ALL LEGALITY, LIABILITY AND RESPONSIBILITY FOR THE CONDITION, USE AND SECURITY/STORAGE OF THE PURCHASED FIREARM. BUYER UNDERSTANDS THAT ALL FIREARMS ARE POTENTIALLY DANGEROUS IF HANDLED IMPROPERLY. UPON PURCHASE, BUYER ASSUMES ALL LIABILITY AND RESPONSIBILITY INCLUDING BUT NOT LIMITED TO THE USAGE AND SAFE STORAGE OF THE PURCHASED FIREARM.

GENERAL INFORMATION

Your firearm is a lightweight, gas piston-operated, air cooled, magazine-fed rifle produced for a high degree of accuracy, reliability, and durability. The firearm's construction features extensive use of aircraft-grade forgings, CNC-machined components and high-quality barrels. The unique design of this system has numerous benefits over the traditional direct-impingement system, as well as other gas piston-operated AR-15 based platforms.

BARREL LIFE

Barrel life depends on how fast the rifle is fi red and how accurate the shooter insists it must be. Firing the rifl e as fast as the trigger can be pulled or sustained full-auto fi re can ruin the barrel in just a few hundred rounds. Firing at controlled rates, both semi-auto and burst, will allow your barrel to last for 15,000 to 20,000 rounds with acceptable accuracy levels. As with any quality barrel, a proper barrel break-in will ensure your new PWS product is as accurate as possible and proper maintenance will help your product last much longer. PWS recommends you clean your rifle or upper at least every 1,000 rounds.

APPEARANCE AND RECEIVER FIT

Your new rifle is not a custom fi rearm. PWS requires a close fi t between the receivers, but normal forging and machining variations may result in play or slight side to side receiver mismatch. This is not a manufacturing defect and has no adverse effect on accuracy or the weapon's function. All PWS rifles and uppers are test-fired before leaving our facility. New rifles will normally show evidence of this fi ring. If the receiver looks light or uneven in color, it is most likely dry and a light coat of oil on the metallic surfaces will improve its appearance. The upper and lower receivers are made from forgings because forgings provide superior strength over billet machining processes. By the very nature of a forging, small dents and dings on the outside of the receiver may be visible. No forging is free of them. This is not a defect.

MODIFICATION WARNING:

YOUR PWS FIREARM WAS DESIGNED TO FUNCTION PROPERLY WITH ITS ORIGINAL COMPONENTS. ALTERATIONS TO THE ORIGINAL COMPONENTS OR REPLACEMENT OF THEM WITH AFTERMARKET (NON-PWS MANUFACTURED) COMPONENTS CAN CAUSE MALFUNCTIONS OR EVEN MAKE THE FIREARM UNSAFE. DO NOT ALTER ANY PART OR ADD /SUBSTITUTE PARTS NOT MANUFACTURED BY PRIMARY WEAPONS SYSTEMS, INC. ATTEMPTED CUSTOMIZATION OF YOUR PWS PRODUCT MAY VOID YOUR WARRANTY.

HOW TO USE THIS MANUAL

Please read this manual carefully before performing any maintenance. This manual must be referred to for all Inspection/Maintenance and Repair procedures.

GENERAL

There are several things you need to know to use this manual efficiently and effectively.

1. All references in the manual are to pages only. Reference to maintenance procedures is to the page where the respective initial setup appears.

2. Illustrations for the maintenance procedures show only those parts affected by the operation being performed.

3. Whenever the male gender is mentioned in the manual (i.e., crewman, repairman), it also pertains to females.

4. When the term "evacuate to support maintenance" is used, the entire rifle must be evacuated to a qualified service center.

5. When a procedure is common to MK1 series rifles, ONLY the MK112 configuration will be depicted. If a selected procedure is not common to all models of the MK1 series, separate procedures will be illustrated.

6. When the word rifle is referenced in text, it will reference the rifle and the carbines.

INDEXES

This manual is organized to help you find the information you need quickly. There are several useful indexes.

1. Table of Contents – lists, in order, all chapters, sections, and appendixes along with the referenced pages.
2. Chapter Overviews – Summarize material covered in the chapter are located at the beginning of each chapter.
3. Symptom Index – Located just before the troubleshooting table in each maintenance chapter lists, in alphabetical order, parts of the rifle with possible malfunctions.

MAINTENANCE PROCEDURES

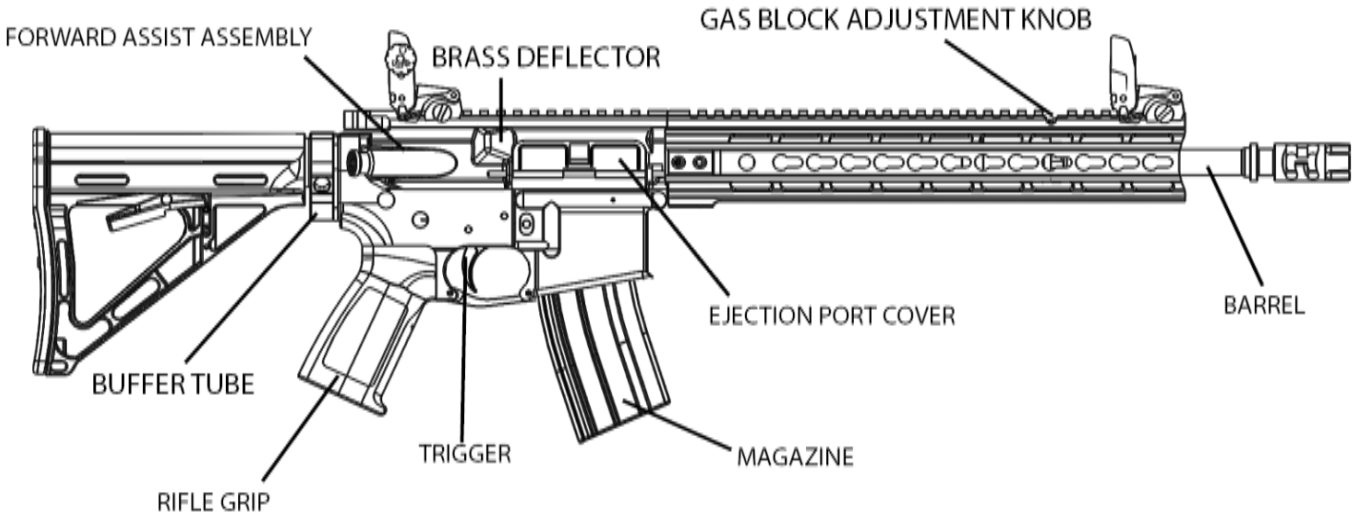
There are two maintenance chapters:

Each maintenance task has an initial setup containing a list of the following things you will need in order to do maintenance task.

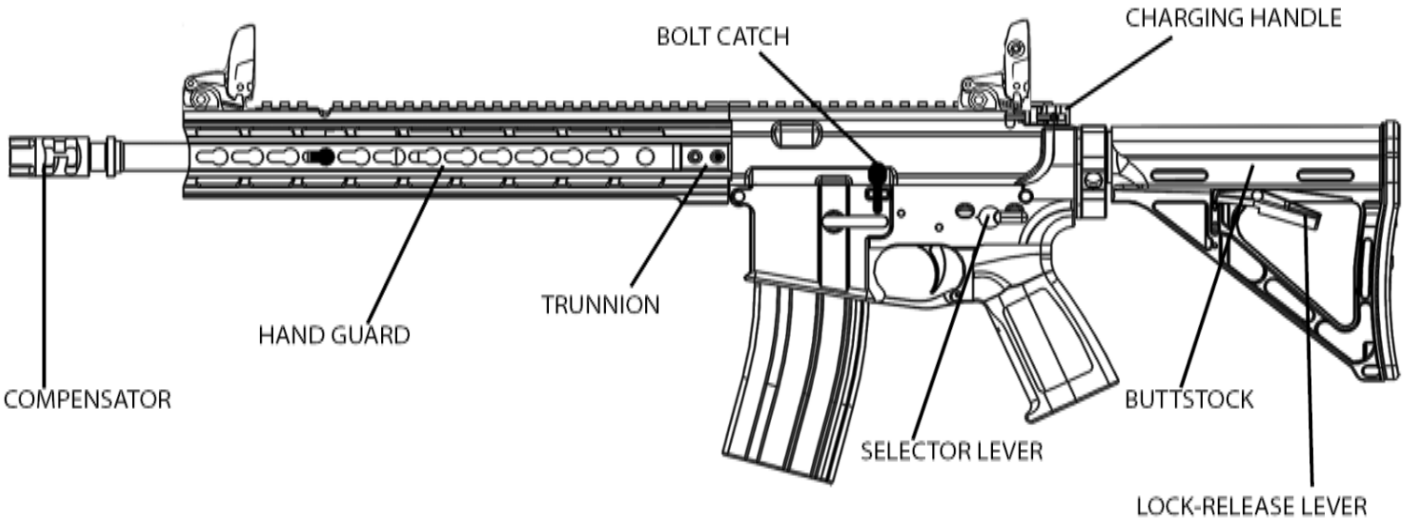
1. Tools and Special Tools – For standard and special tools, see appendixes A.
2. Materials/Parts – Lists expendable materials followed part number or appendix reference.
3. References – Lists other publications containing necessary information.
4. Equipment Condition – Lists conditions to be met before starting the procedure.
5. General Safety Instructions – Lists safety instructions to follow before performing maintenance procedures.

EXTERNAL VIEW OF THE MK1 SERIES RIFLE

RIGHT SIDE



LEFT SIDE



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CHAPTER 1
INTRODUCTION

CHAPTER OVERVIEW

This chapter contains general information, equipment description and data, and principles of operation for the MK1 Series rifles.

Section I. GENERAL INFORMATION

1-1 SCOPE

a. Type of Manual – End User Use & Maintenance.

b. Model Number and Equipment Name – MK107, MK110, MK112, MK114, MK116 and MK118 Carbines.

c. Purpose of Equipment – Provides personnel an offensive/defensive capability with small arms fire.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-2 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

a. Characteristics.

(1) Light weight
(2) Air-cooled
(3) Gas-Piston operated
(4) Magazine-fed
(5) Semiautomatic or select-fire

b. Capabilities.

Provides personnel an offensive/defensive capability to engage targets with direct small arms fire.

c. Features.

(1) The MK1 series is a significant product improvement for the M4/M16-type carbines and rifles. Utilizing a long stroke piston system, the MK1 series greatly reduces fouling in the action of the weapon making it as reliable as the AK47 that it was designed after.

(2) Receivers are made of T7075 Forgings that ensure safety, durability, and function of the rifles while keeping weight and cost at a minimum.

(3) The hand guard system features the VLTOR KeyMod System which comes standard with two 2” sections of 1913 rail as well as a continuous 1913 top rail.

(4) The operating system utilizes an operating rod that is attached to the bolt carrier and a floating head piston that is attached to the operating rod. With only one moving assembly, the system is rugged, simple and versatile.

(4) Chromoly steel, Isonite QPQ treated, button rifled barrels deliver unmatched accuracy and performance.

1-3 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

a. MAGAZINE. 30 round capacity.

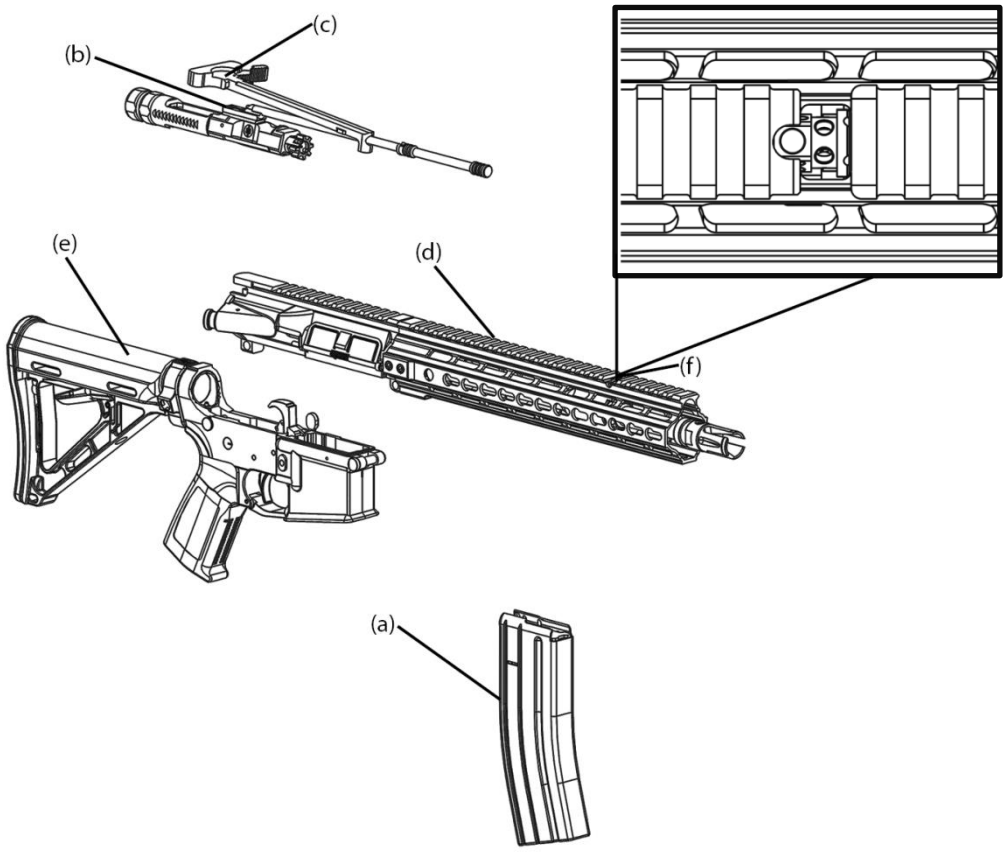
b. BOLT CARRIER ASSEMBLY. Carries bolt assembly to chamber and fires the weapon. Contains the firing pin, cartridge extractor, bolt assembly, cartridge ejector, firing pin retaining pin, bolt return spring and bolt cam pin.

c. CHARGING HANDLE ASSEMBLY. Provides a means of charging the weapon.

d. UPPER RECEIVER AND BARREL ASSEMBLY. Upper receiver contains, ejection port, ejection port cover, a housing for key and bolt carrier assembly and bolt assembly, and Picatinny rail. Carbine barrel assembly is air-cooled, contains the trunnion, gas block, quad rail, compensator, and QD sling swivel points.

e. LOWER RECEIVER AND BUTTSTOCK ASSEMBLY. Lower receiver contains the trigger assembly, sear, hammer assembly, selector lever, rifle grip, bolt catch, and buttstock assembly. The buttstock assembly houses the action spring, buffer assembly, and extension assembly.

f. ADJUSTABLE GAS BLOCK. The 4 position adjustable gas block allows the user to adjust for standard ammo (position 1), military ammo (position 2), suppressed with standard ammo (position 3) and suppressed with military ammo (position 4). The X setting is for removal of the knob for annual maintenance.



1-4 EQUIPMENT DATA

	US CUSTOMARY	METRIC
Weight:		
MK107, .223 Wylde without magazine	5 lbs., 12 oz.	2.61 kg
MK110, .223 Wylde without magazine	6 lbs., 2 oz.	2.79 kg
MK112, .300 BLK without magazine	6 lbs., 3 oz.	2.82 kg
MK112, .223 Wylde without magazine	6 lbs., 7 oz.	2.91 kg
MK114, .223 Wylde without magazine	6 lbs., 8 oz.	2.96 kg
MK116, .223 Wylde without magazine	6 lbs., 10 oz.	3.01 kg
MK116, .300 BLK without magazine	6 lbs., 7 oz.	2.91 kg
MK118, .223 Wylde without magazine	6 lbs., 15 oz.	3.15 kg
Overall Length:		
MK107 with compensator, buttstock closed	24.25 in	61.6 cm
MK110 with compensator, buttstock closed	27.5 in	69.9 cm
MK112 with compensator, buttstock closed	29.2 in	74.9 cm
MK114 with compensator, buttstock closed	31.4 in	79.7 cm
MK116 with compensator, buttstock closed	33.0 in	83.8 cm
Mk118 with compensator, buttstock closed	34.9 in	88.6 cm
Barrel Length:		
MK107 (all calibers)	7.75 in	19.7 cm
MK110 (all calibers)	10.75 in	27.3 cm
MK112 (all calibers)	12.5 in	31.75 cm
MK114 (all calibers)	14.5 in	36.8 cm
MK116 (all calibers)	16 in	40.6 cm
MK118 (all calibers)	18 in	45.7 cm
Mechanical Features:		
Rifling	Right-hand twist, 6 groove, 1 turn in 8 inches (20.32.cm)	
Method of Operation	Gas Piston	
Type of Breaching Mechanism	Rotating bolt	
Method of Feeding	Magazine	
Cooling	Air	
Trigger pull	5.5 - 7.5lbs.	2.5 -3.4 kg

1-4.1 EQUIPMENT DATA (cont.)

	US CUSTOMARY	METRIC
Firing Characteristics		
MK107, 5.56 Muzzle Velocity	2368 ft/sec	721.8m/sec
MK110, .223 Wylde Muzzle Velocity	2654 ft/sec	808.9 m/sec
MK112, .223 Wylde Muzzle Velocity	2833 ft/sec	863.2 m/sec
MK112, .300 BLK Muzzle Velocity	2355 ft/sec	717.8 m/sec
MK114, .223 Wylde Muzzle Velocity	2330 ft/sec	710 m/sec
MK116, .223 Wylde Muzzle Velocity	2993 ft/sec	912.3 m/sec
MK116, .300 BLK Muzzle Velocity	2444 ft/sec	744.9 m/sec
MK118, .223 Wylde Muzzle Velocity	3049 ft/sec	929.3 m/sec
MK107, .223 Wylde Muzzle Energy	772 ft/lbs	518.8 m/kgs
MK110, .223 Wylde Muzzle Energy	970 ft/lbs	651.8m/kgs
MK112, .223 Wylde Muzzle Energy	1105 ft/lbs	742.5 m/kgs
MK112, .300 BLK Muzzle Energy	1355 ft/lbs	910.5 m/kgs
MK114, .223 Wylde Muzzle Energy	1483 ft/lbs	996 m/kgs
MK116, .223 Wylde Muzzle Energy	1233 ft/lbs	828.5 m/kgs
MK116, 300 BLK Muzzle Energy	1459 ft/lbs	980.4 m/kgs
MK118, .223 Wylde Muzzle Velocity	1280 ft/lbs	860 m/kgs
Maximum Rate of Fire		
MK107, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	218 yds	200 m
Maximum Range, Area Target	328 yds	300 m
MK110, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	328 yds	300 m
Maximum Range, Area Target	437 yds	400 m

1-4.2 EQUIPMENT DATA (cont.)

	US CUSTOMARY	METRIC
Maximum Rate of Fire (continued)		
MK112, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	437 yds	400 m
Maximum Range, Area Target	547 yds	500 m
MK112, .300 BLK		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	437 yds	400 m
Maximum Range, Area Target	547 yds	500 m
MK114, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	547 yds	500 m
Maximum Range, Area Target	656 yds	600 m
MK116, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	547 yds	500 m
Maximum Range, Area Target	656 yds	600 m
MK1116, .300 BLK		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	547 yds	500 m
Maximum Range, Area Target	656 yds	600 m
MK118, .223 Wylde		
Semiautomatic	45 rds/min	
Burst	90 rds/min	
Sustained Rate of Fire	12 - 15 rds/min	
Maximum Range, Point Target	656 yds	600 m
Maximum Range, Area Target	765 yds	700 m

Section III. PRINCIPLES OF OPERATION

1-5 GENERAL

The MK1 and MK1S series:

a. Is gas-piston operated and fires in either the semiautomatic (MK1) or select fire (MK1S) mode.

b. Has positive locking of the bolt. Firing pin is part of the bolt carrier assembly and cannot strike the primer until the bolt assembly is fully locked.

1-6 PRINCIPLES OF OPERATION

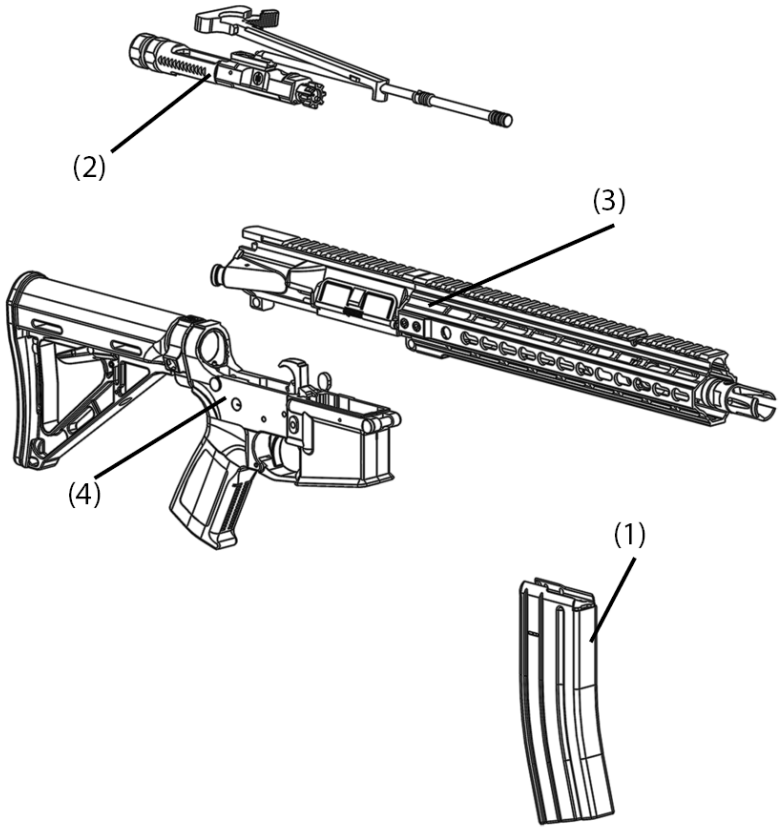
a. **MAGAZINE.** Holds loaded rounds ready for feeding as well as quick reload capabilities for sustained firing.

b. **BOLT CARRIER ASSEMBLY.** Provides stripping, chambering, locking, firing, extraction, and ejection of cartridges using the propelling gases that exert pressure on the piston and operating rod.

c. **CHARGING HANDLE ASSEMBLY.** Provides initial charging of the weapon. The handle latch locks the charging handle assembly in the forward position during operation.

d. **MK1 UPPER RECEIVER AND BARREL ASSEMBLY.** Provides support for the bolt carrier assembly. The barrel chambers the cartridge for firing and directs the projectile.

e. **LOWER RECEIVER AND BUTTSTOCK ASSEMBLY.** Provides firing control for the rifle and carbine.



CHAPTER 2
END USER MAINTENANCE INSTRUCTIONS

CHAPTER OVERVIEW

This chapter provides information and instructions to help keep the rifle in good repair and contains the following sections:

a. Repair Parts, Special Tools, and Support Equipment
b. Service Upon Receipt
c. Preventive Maintenance Checks and Services (PMCS)
d. Troubleshooting
e. Maintenance Procedures

Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

2-1 COMMON TOOLS AND EQUIPMENT

Allen Wrench Set Standard	(1)	1/4 x 3/32 Pin Punch	(1)	Needle Nose Pliers	(1)
MK1/MK2 Bolt Assembly	(1)	Roll Pin Starter Punch (9”)	(1)	PWS Cleaning Kit	(1)
Dead Blow Hammer, 8oz	(1)	Roll Pin Punch (8”)	(1)		
Ball Peen Hammer, 12oz	(1)	Open End Wrench 3/4, 5/8	(1)		
Ball Peen Hammer, 4oz	(1)	Torque Wrench In/Lbs.	(1)		
3/32 No.3 Roll Pin Punch	(1)	Loctite 262	(1)		
3/8 x 3/16 Pin Punch	(1)	Upper Receiver Block, (.223)	(1)		
1/4 x 1/16 Pin Punch	(1)	Lower Receiver Block, (.223)	(1)		

2-2 SPECIAL TOOLS, AND SUPPORT EQUIPMENT

No special tools are required for end user maintenance.

2-3 REPAIR PARTS

Repair parts are listed and illustrated in appendix B of this manual.

Section II. SERVICE UPON RECEIPT

2-4 GENERAL

a. Inspect the rifle for damage incurred during shipment. If rifle has been damaged, report the damage immediately to PWS Customer Service.

b. Check the rifle and corresponding serial numbers against the packing slip to see if shipment is complete.

2-5 SERVICE UPON RECEIPT OF MATERIEL

WARNING

Before starting an inspection, be sure to clear the rifle. Do not actuate the trigger before clearing the rifle. Inspect the chamber to make sure it is empty and free of obstructions. Check to see there are no obstructions in the barrel and no ammunition is in position to be chambered.

LOCATION	ITEM	ACTION	REMARKS
1. Container	a. MK1 Carbine	a. Remove Rifle from Containers.	
		b. Inspect the equipment for damage during shipment.	If damage is found, contact Customer Service Immediately.
		c. Check the equipment against the packing list to see if the shipment is complete	If discrepancy is found, contact Customer Service Immediately.
	b. Basic Issue Items	Check for missing items	If discrepancy is found, contact Customer Service Immediately.
2. MK1 Series carbine	a. Barrel Assembly	If volatile corrosion inhibitor (VCI) is in barrel, remove and discard	
	b. All Parts	a. Field-strip rifle and inspect for missing, damaged, rusted parts.	
		b. Clean and lubricate	
		c. Reassemble	
		d. Function check	
		e. Check to see whether the equipment has been modified	If discrepancy is found, contact Customer Service Immediately.
	c. Magazine	Check for positive retention and functioning of bolt catch	

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-6 GENERAL

This section contains the procedures and instructions necessary to perform unit preventive maintenance checks and services. These services are to be performed by unit maintenance personnel with the assistance of the operator where practical.

2-7 PREVENTIVE MAINTENANCE CHECKS AND SERVICES

WARNING

Before starting an inspection, be sure to clear the rifle. Do not pull the trigger until the weapon has been cleared. Inspect the chamber to ensure that it is empty and no ammunition is in position to be chambered. Do not keep live ammunition near the work area.

a. General – The PMCS procedures are contained in the table following. They are arranged in logical sequence requiring a minimum amount of time on the part of the persons performing them

b. Item No. Column – Checks and services are numbered in disassembly sequence.

c. Interval Column – This column gives the designated interval when each check should be performed.

d. Item To Be Checked Or Serviced Column – This column lists the items to be checked or serviced.

e. Procedure Column – This column contains a brief description of the procedure by which the check is to be performed. It contains all the information required to accomplish the checks and services. Information marked SH Indicates a specific equipment shortcoming and the procedure needed to correct the shortcoming.

NOTE

For the purpose of this technical manual, the following definition is supplied. This definition is not intended to apply to any other document Shortcoming (SH): A fault that requires maintenance or supply action on a piece of equipment, but does not render equipment Not Mission Capable

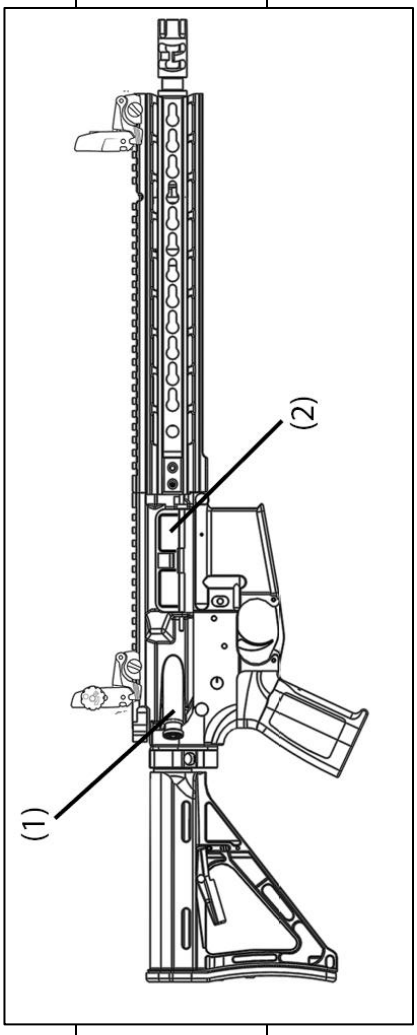
f. Not Fully Mission Capable If: Column - This column contains a brief statement of the condition (e.g., malfunction, shortage) that would cause the covered equipment to be less than fully ready to perform its assigned mission.

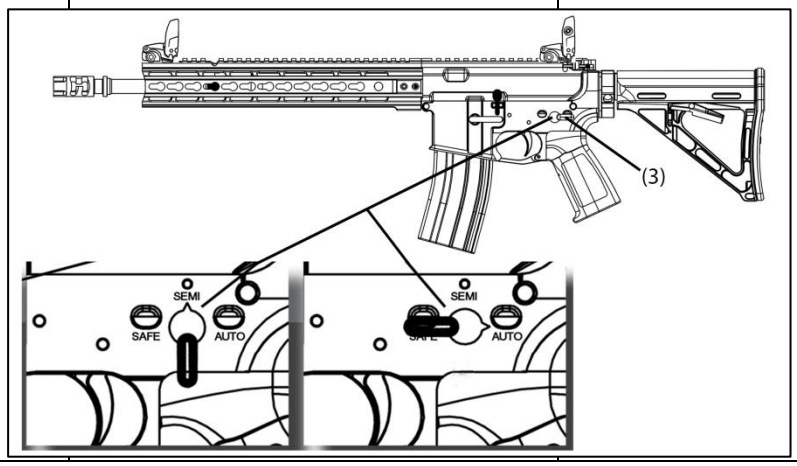
NOTE

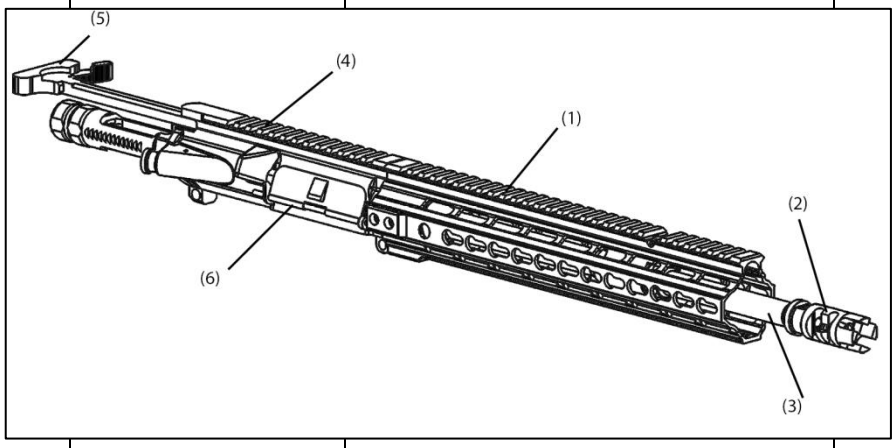
An inactive weapon is a weapon which has been stored in an arms room for a period of 90 days without use. The weapon may or may not have been assigned to an individual. Inactive weapons shall receive quarterly PMCS unless inspection reveals more frequent servicing is necessary.

Normal cleaning (PMCS) of an inactive weapon will be performed every 90 days. Should the unit armorer detect corrosion on a weapon prior to the end of the 90-day period, the PMCS should be performed immediately.

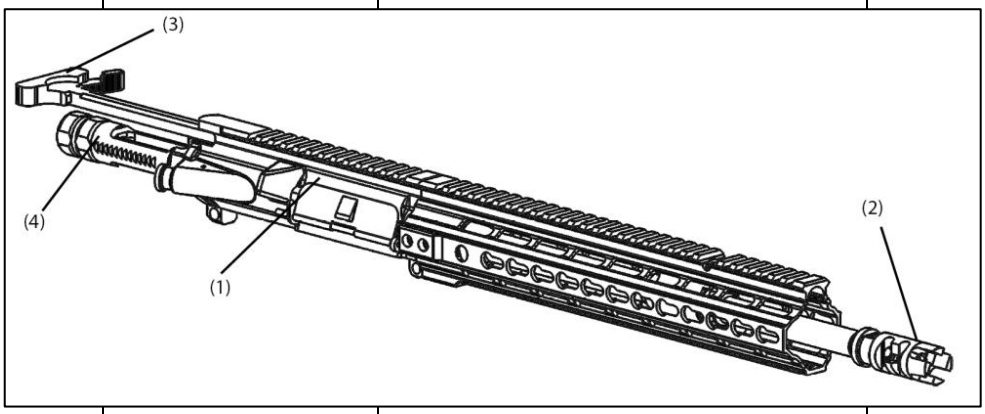
ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Quarterly	Charging handle assembly and selector lever	Pull charging handle (1) to rear. Ensure chamber is clear. Let bolt carrier assembly (2) close. Leave hammer in cocked position. Do not pull trigger.	Charging handles does not lock in place when in the forward position.
			Place selector lever (3) in SAFE position. Pull Trigger. Place selector lever (3) in SEMI position.	Hammer falls
			Pull Trigger	Hammer does not fall
			Hold trigger to the rear, charge weapon, and release the trigger with a slow, smooth motion, without hesitations or stops, until the trigger is full forward (an audible click should be heard)	Hammer Falls
			Repeat the above SEMI position test five times	The weapon malfunctions during any of these five tests.
			MK1s / Select Fire Version Only Place selector lever (3) in AUTO position, charge the weapon and squeeze the trigger. Hammer should fall	Hammer does not fall.
			Hold trigger to rear, charge the weapon and release the trigger. Squeeze the trigger. Hammer should not fall.	Hammer Falls

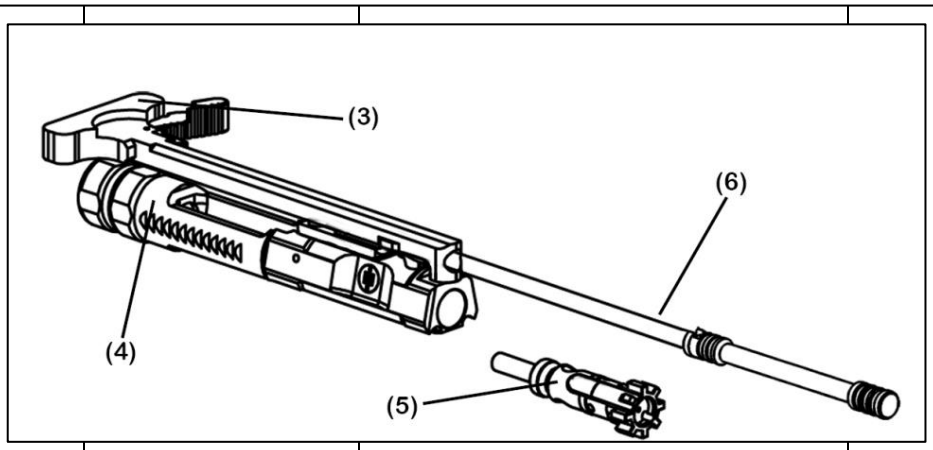




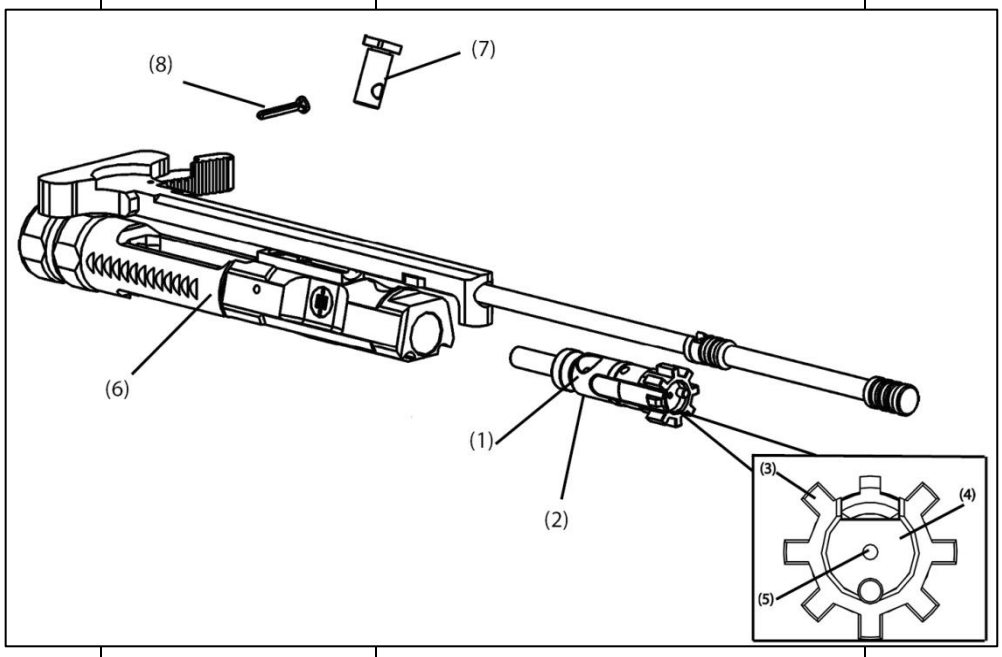
ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
1	Quarterly (cont)	Charging handle assembly and selector lever (cont)	**NOTE** Automatic sear should have released hammer while holding trigger in the squeezed position before releasing and re-squeezing the trigger. **All Weapons** With hammer in forward position, using moderate finger/thumb pressure, attempt to place the selector lever (3) in SAFE position.	Moderate finger/thumb pressure moves selector lever to SAFE position.
				
2	Quarterly	Upper receiver and barrel assembly (handguard assemblies)	Inspect handguard assembly (1) for cracks and/or other damage. Dings and dents are acceptable in rails providing they do not prohibit attaching accessories to the picatinny rails.	Rails are missing or unserviceable.
3	Quarterly	Upper receiver and barrel assembly (serviceability check)	Release takedown pins and open and separate upper and lower receiver. Hand check the compensator (2) for looseness on the barrel. Hand check barrel (3) for looseness on the upper receiver. (4)	Compensator or barrel is loose.
			Check charging handle (5) and ejection port cover (6) for defects and proper function.	Charging handle (5) is defective

ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
3		Upper receiver and barrel assembly (serviceability check) (cont.)	Inspect upper receiver (1) finish for scratches or worn shiny spots. If shiny or worn spots are visible, repair in accordance with unit SOP. With one hand, position the upper (1) so that the muzzle (2) is pointing down at approximately a 40-degree angle. Pull the charging handle (3) rearward. Holding the bolt carrier (4) to the rear, push the charging handle (3) forward. Release the bolt carrier (4). Bolt carrier group should close and lock under its own weight. If it does not, remove the bolt assembly (5) from the bolt carrier and slide the bolt carrier and charging handle back into the receiver (1). If carrier or operating rod (6) seem to drag in the receiver, clean and lube as necessary. If unable to resolve, contact PWS Customer Service.	If shiny or warn spots would compromise mission. Cleaning and lubrication does not correct malfunction.

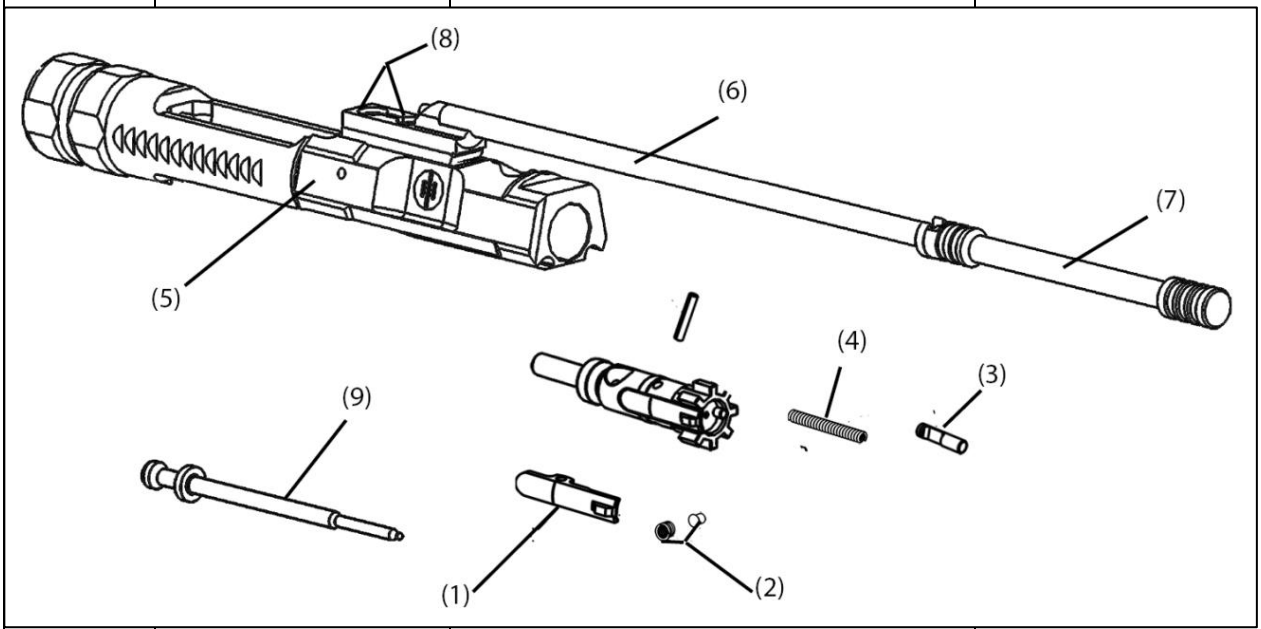




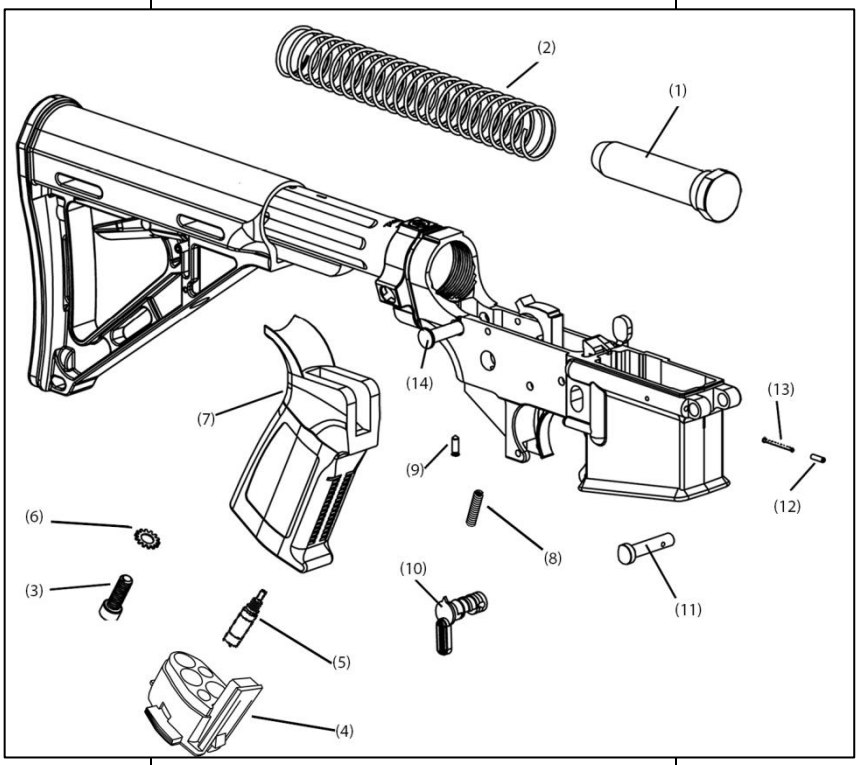
ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
WARNING **Below certified armorer level maintenance, does not interchange bolt assemblies from one rifle to another.** **Doing so may result in injury to, or death of, personnel.**				
4	Quarterly	Key and bolt carrier assembly and bolt assembly (serviceability check)	Remove and dissemble. Visually inspect bolt assembly (1) for cracks, especially in the area of the bolt cam pin hole (2). Check for cracks on locking lugs (3), for a cluster of pits or chipped bolt face (4) and for an elongated firing pin hole (5). If cracked or broken, contact PWS Customer Service. Insert the bolt assembly (1) into the key and bolt carrier assembly (6). Turn key and bolt carrier assembly (6) so the bolt assembly (1) points down. The bolt assembly should move and slide freely in the bolt carrier assembly (6). Inspect bolt cam pin (7) for damage or excessive wear. Ensure firing pin retaining pin (8) is structurally sound.	Defects are found Missing or broken firing pin retaining pin or bolt cam pin.



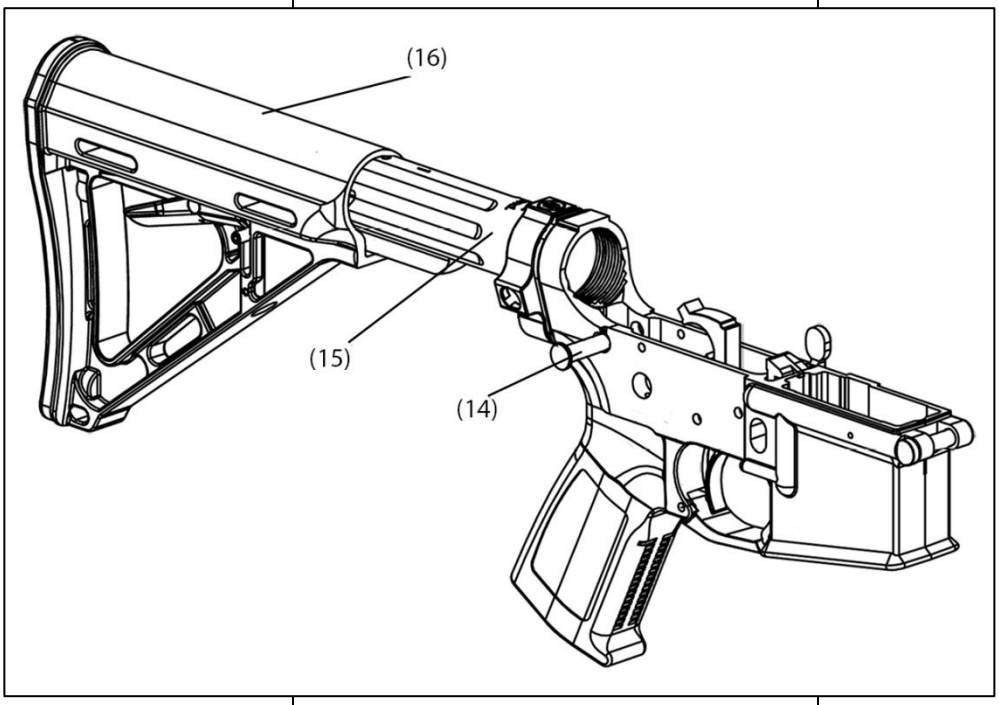
ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
5	Quarterly	Bolt assembly and bolt carrier assembly (serviceability check)	Check extractor (1) extractor spring assembly (2), ejector (3) and ejector spring (4) for dirt and serviceability. If dirty, clean, lubricate and reassemble. If unserviceable, replace as necessary.	Parts are missing or unserviceable.
			Check bolt carrier assembly (5), carrier key and operating rod assembly (6), and piston (7) for excess wear, cracks or other damage. Ensure carrier key screws (8) are tight and staked.	Bolt carrier assembly or bolt is damaged or unserviceable. Carrier key is loose.
			Check firing pin (9) for pits or breaks. If damaged, replace firing pin.	Firing pin is damaged.



ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
6	Quarterly	Lower Receiver and buttstock assembly. (serviceability check)	Remove buffer assembly (1) and action spring (2). Check buffer assembly for cracks	Buffer assembly is cracked
			Check action spring (2) for kinks and free length. Free length should be 10 1/16 inches (25.56cm) minimum to 11 1/4 inches (28.58cm) maximum. Do not attempt to adjust spring length.	Spring is kinked or does not meet free length requirements.
			Remove pistol grip screw (3), Grip insert (4), Gas Block Adjustment tool (5) lock washer (6) pistol grip (7) helical spring (8), safety detent (9), selector lever (10), pivot pin (11), pivot pin detent (12), and helical spring (13). Clean and lube as necessary.	Components are defective or damaged
			Disengage takedown pin (14) and pull out. Push back in to re-engage takedown. An audible click should be heard.	Components are defective or damaged.



ITEM NO.	INTERVAL	ITEMS TO BE CHECKED OR SERVICED	PROCEDURE	NOT FULLY MISSION CAPABLE IF:
6	Quarterly	Lower Receiver and buttstock assembly. (serviceability check) (continued)	Lubricate helical compression spring and takedown pin detent (14) by placing one drop of lubricant in the channel at the rear of the takedown pin. Allow the lubricant to work its way around the pin detent and spring (14). Check buffer tube (15) and buttstock assembly (16) for damage.	Components are damaged. The buffer tube or buttstock is cracked or otherwise defective.



Section IV. TROUBLESHOOTING

2-8 GENERAL

a. This section contains unit level troubleshooting information for locating and correcting most of the operating troubles which may develop in the MK1 Series carbine. Each malfunction for the individual part or assembly is followed by a list of tests or inspections which will help you to determine the corrective actions in the order listed.

b. This manual cannot list all malfunctions that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, see individual repair sections in the maintenance procedures on each major assembly.

2-9 TROUBLESHOOTING PROCEDURES

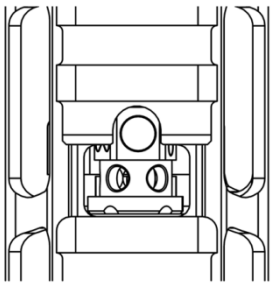
Refer to troubleshooting table for malfunctions, tests, and corrective actions. The symptom index is provided for a quick reference of the malfunctions covered in the table.

SYMPTOM INDEX

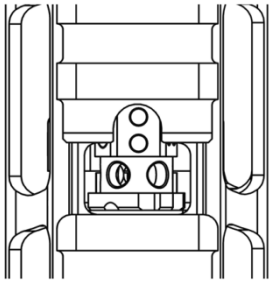
	Page
Failure of magazine to lock in rifle	33
Failure to feed	33
Failure to chamber	34
Failure to lock	34
Failure to fire	36
Failure to unlock	37
Failure to extract	37
Failure to eject	37
Failure to cock	38
Short recoil	38
Rifle cannot be zeroed	39
Failure to cycle with selector lever set on BURST	39
Fires two rounds with one pull of trigger with selector lever set on SEMI (double firing)	39
Fires with selector lever on SAFE or when trigger is released with selector lever on SEMI	39
Bolt assembly falls to lock to rear after firing last round	39

GAS ADJUSTMENT SETTINGS

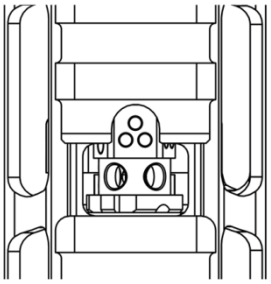
Before starting any trouble shooting, ensure that the gas adjustment knob is in the proper position. The 4 position adjustable gas block allows the user to adjust for standard ammo, military ammo, and two suppressed settings. The X setting is for removal of the knob for annual maintenance.



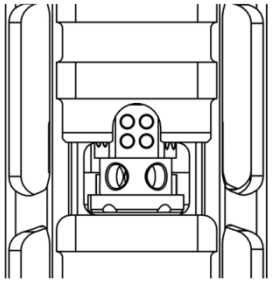
Position 1, marked by a single large circle, is for normal operation and can be used with standard ammo or, in many cases, with military ammo.



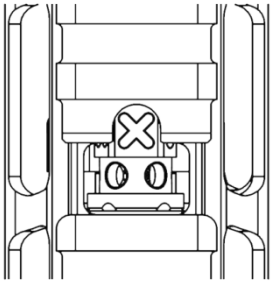
Position 2, marked by 2 circles, is for use with hotter loads such as military ammunition.



Position 3, marked with 3 circles, is for suppressed use when running standard ammunition.



Position 4, marked with 4 circles, is for suppressed use when running hotter loads such as military ammunition.

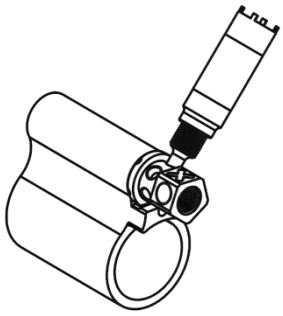


The X position is used only to remove the gas plug for annual maintenance ONLY.*

<u>*FIRING YOUR WEAPON WHILE ON THE X SETTING WILL CAUSE DAMAGE AND/OR LOSS TO YOUR GAS ADJUSTMENT KNOB.</u>

The gas adjustment plug contains a detent and spring to lock it in place. When you move it to the X setting, the knob will move out toward the end of the barrel. Do not force it to the next setting. Doing so may result in damage to your gas adjustment knob or gas block.

Using the gas block adjustment tool (1) located in the grip of your weapon, push the gas adjustment knob back toward the gas block and the knob will turn freely to the next setting.



TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. FAILURE OF MAGAZINE TO LOCK IN RIFLE

Step 1 — Dirty or corroded magazine catch (1).
Disassemble and Clean

Step 2 — Defective magazine catch spring (2)
Replace spring

Step 3 — Worn or broken magazine catch (1).
Replace magazine catch

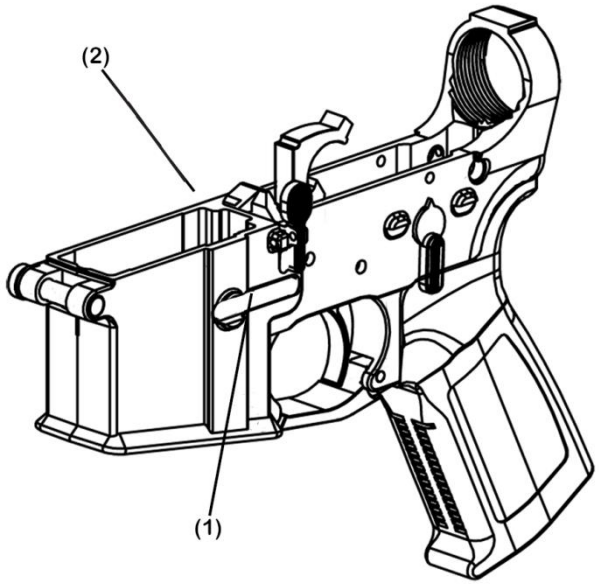
2. FAILURE TO FEED

Step 1 — Magazine catch spring weak or broken.
Replace spring

Step 2 — Magazine catch (1) defective
Replace magazine catch

Step 3 — Magazine catch (1) out of adjustment (will not retain magazine)
Adjust magazine catch

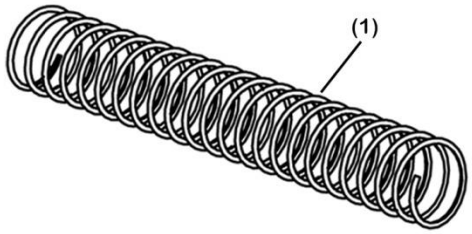
Step 4 — Short recoil
Refer to page 38



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

3. FAILURE TO CHAMBER

Step 1 Weak or broken action spring (1). (Refer to item 6 in PMCS section)
Replace spring

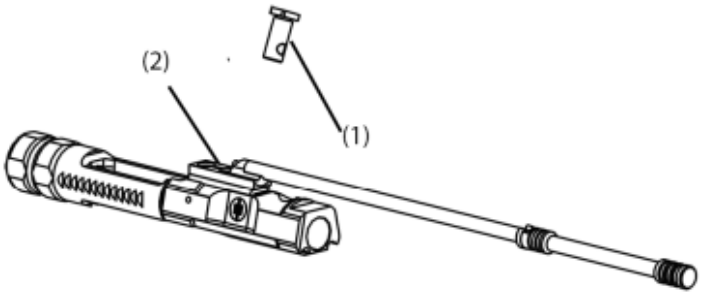


Step 2 Short Recoil
Refer to page 38

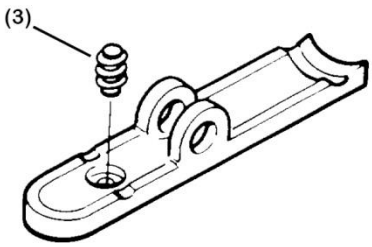
4. FAILURE TO LOCK

Step 1 Bolt cam pin (1) missing
Replace bolt cam pin

Step 2 Loose or damaged bolt carrier key (2).
Tighten and re-stake carrier key or replace as necessary



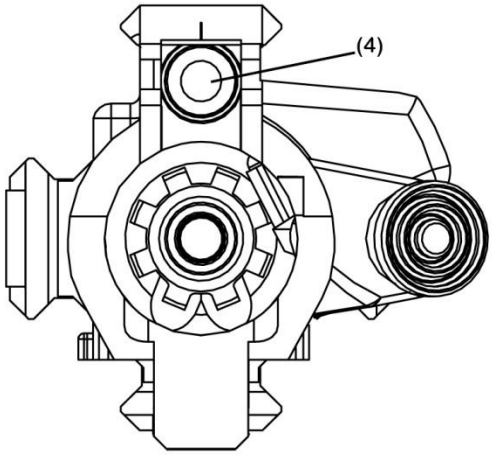
Step 3 Improperly assembled extractor spring assembly (3)
Assemble correctly



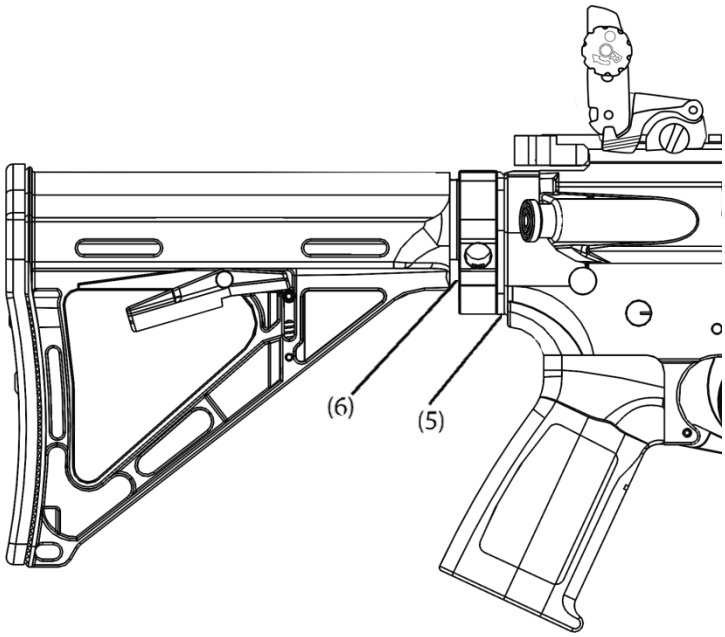
MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

4. FAILURE TO LOCK (CONT)

Step 4 Excessive carbon build-up in piston tube (4)
Clean piston tube using t-handle and .40 caliber brush

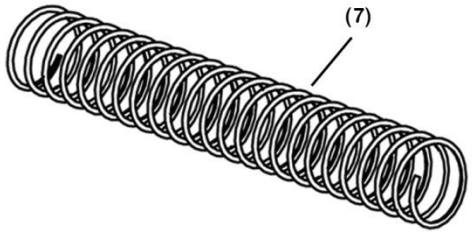


Step 5 Buffer tube is out of alignment (applicable only to weapons using the PWS EBT)
Space between buffer tube and tension plate (5) should be parallel.
Relieve tension and readjust buffer tube by unscrewing bottom screw (6).



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

Step 6 Weak or broken action spring (1). (Refer to item 6 in PMCS section)
Replace spring



5. FAILURE TO FIRE

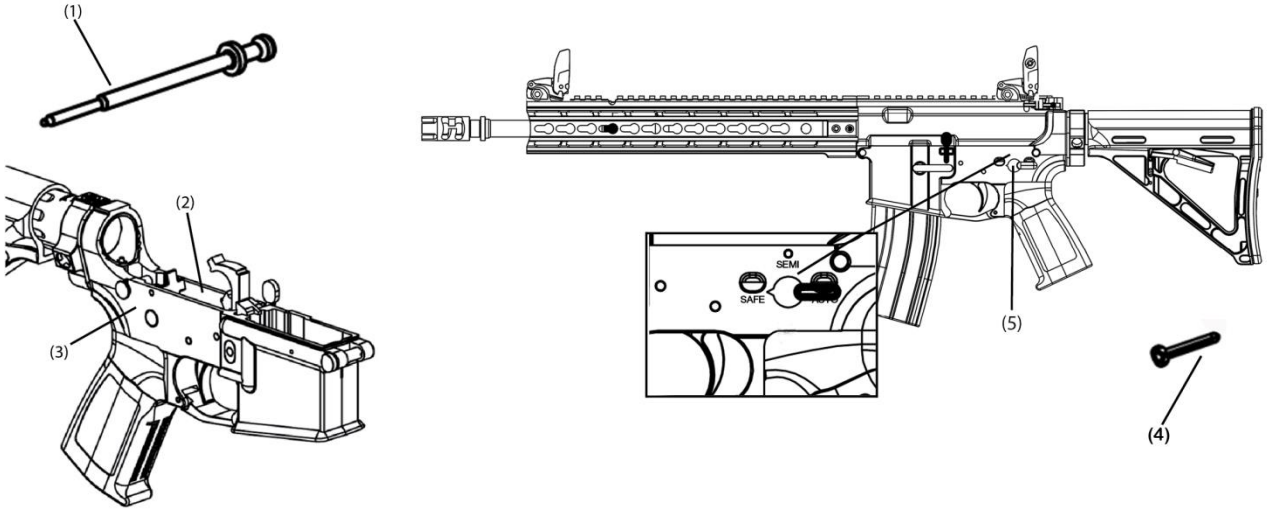
Step 1 Broken or chipped firing pin (1)
Replace firing pin

Step 2 Fire control group (2) and/or lower receiver assembly (3) improperly assembled or damaged
Repair or replace in accordance with unit SOP

Step 3 Broken, defective, or missing firing pin retaining pin (4)
Replace

Step 4 Selector Lever (5) frozen on safe position

Disassemble, clean, reassemble or replace defective components



MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

6. FAILURE TO UNLOCK

Step 1 — Burred locking lugs (1) on bolt assembly
Remove burrs

Step 2 — Burred lugs (2) on barrel extension
Remove burrs

Step 3 — Short Recoil
Refer to page 38

Step 4 — Debris or fouling in chamber
Clean chamber with copper cleaner or honing tool

7. FAILURE TO EXTRACT

Step 1 — Defective extractor (3), extractor pin (4) or extractor spring assembly (5).
Replace defective components

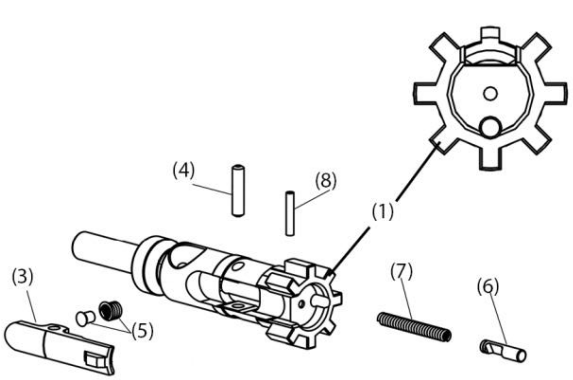
Step 2 — Short Recoil
Refer to page 38

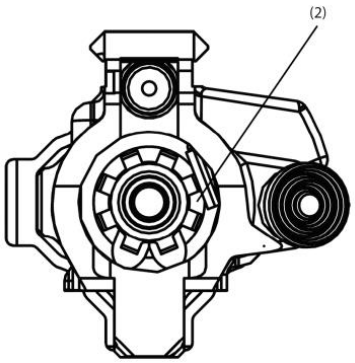
8. FAILURE TO EJECT

Step 1 — Broken ejector (6), weak or broken ejector spring (7) or broken ejector pin (8)
Replace defective components

Step 2 — Ejector (6) stuck in bolt body
Disassemble and clean

Step 3 — Short Recoil
Refer to page 38





MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

9. FAILURE TO COCK

Step 1 Worn, broken or missing parts of fire control group
Replace defective or missing components

Step 2 Short Recoil
See below

10. SHORT RECOIL / SHORT STROKING

Step 1 Broken or damaged action spring
Replace action spring

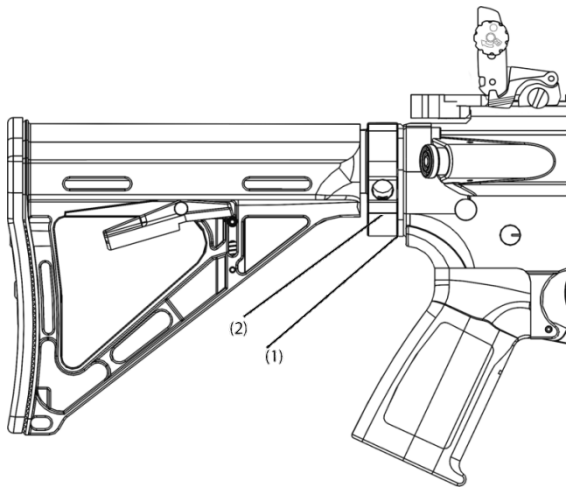
Step 2 Un-lubricated or dirty action spring and/or receiver extension (buffer tube).
Clean and lubricate

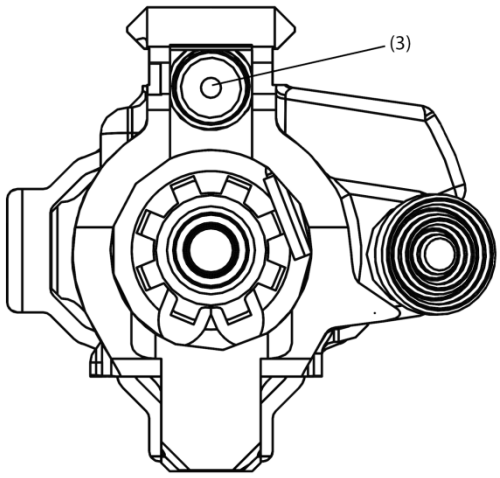
Step 3 Improper buffer weight (buffer is too heavy)
Replace buffer with standard carbine buffer

Step 4 Buffer tube is out of alignment (applicable only to weapons using the PWS EBT)
Space between buffer tube and tension plate (1) should be parallel.
Relieve tension and readjust buffer tube by unscrewing bottom screw (2).

Step 5 Excessive carbon build-up in piston tube (3)
Clean piston tube using t-handle and .40 caliber brush

Step 6 Out of spec ammunition
Replace ammunition



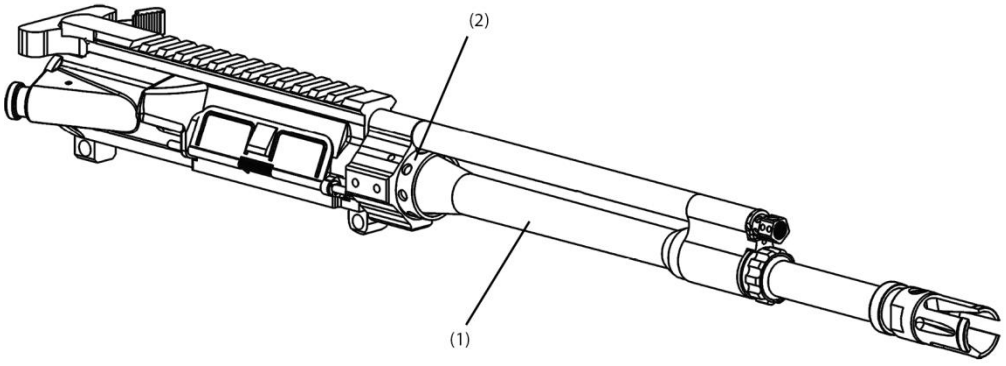


MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

11. RIFLE CANNOT BE ZEROED

Step 1 Defective barrel assembly (1)
Contact PWS Customer service or replace barrel

Step 2 Barrel nut is loose
Remove rails and tighten barrel nut (2) and re-torque to 65-70 ft/lbs



12. FAILURE TO CYCLE WITH SELECTOR LEVER SET ON AUTO (SELECT FIRE ONLY)

Step 1 Faulty selector lever
Replace selector lever

13. FIRES TWO ROUNDS WITH ONE PULL OF THE TRIGGER WITH SELECTOR ON SEMI (DOUBLE FIRING)

Step 1 Perform Function Test
If any part of function test fails, replace fire control group

14. FIRES WITH SELECTOR LEVER ON SAFE OR WHEN TRIGGER IS RELEASED

Step 1 Worn, broken or missing parts of fire control group
Replace fire control group

15. BOLT ASSEMBLY FAILS TO LOCK TO REAR AFTER FIRING LAST ROUND

Step 1 Magazine worn, or broken
Replace magazine.

Step 2 Magazine catch spring weak or broken.
Replace magazine.

Step 3 Broken bolt catch and/or spring.
Replace bolt catch and/or spring

Section V. MAINTENANCE PROCEDURES

2-10 INITIAL SETUP

The following information will reduce the space required for the initial setup portion of the maintenance procedures.

a. Materials/Parts required are not listed unless they apply to the procedure

b. Personnel required is listed only if the task requires more than one person

c. The normal standard equipment condition references the manner in which the assembly remains from the previous step in the assembly or disassembly process. Equipment condition is not listed unless some other condition is required.

2-11 LUBRICATION GENERAL

a. PWS uses and recommends the Gun-Ease line of cleaning products. PWS has assembled a cleaning kit specifically for the MK1 and MK2 series rifles and uppers.

b. Whenever the term cleaner, lubricant, preservative (CLP) or the words lubricant, lube, LSA or LAW are cited in this manual, they can be interpreted as any commercially available product that falls within the required parameters of the particular application. Substitutions can be utilized as applicable as long as they adhered to the following:

Under all but the coldest arctic conditions, CLP, LSA or other such lubricants can be used as long as they are designed to operate in the conditions in which they are being deployed.

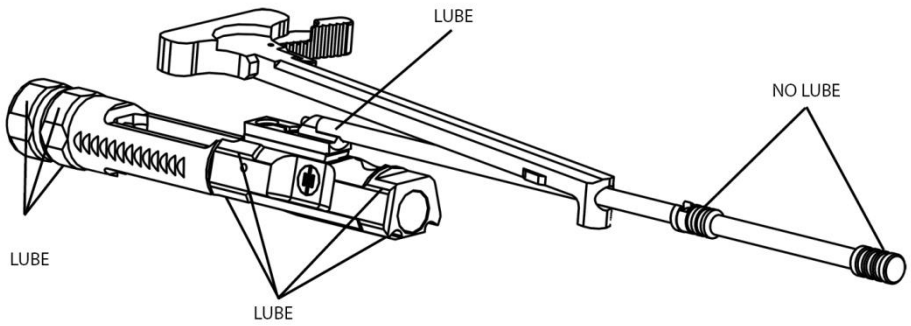
LAW is the lubricant to use during cold arctic conditions, +10F (-12C) and below

Any lubricants may be used from 10°F to + 100F (-12C to 38°C)

Rifle Bore Cleaner (RBC) may be used to remove carbon buildup in the bore and other portions of the rifle.

NOTE
Do NOT lubricate the piston head.

The illustration below shows the only points on the weapon that should be lubricated. Additional or excess lubrication is unnecessary and can cause malfunctions by attracting dirt and debris.



2-12 MAJOR COMPONENTS OF MK1 SERIES RIFLES

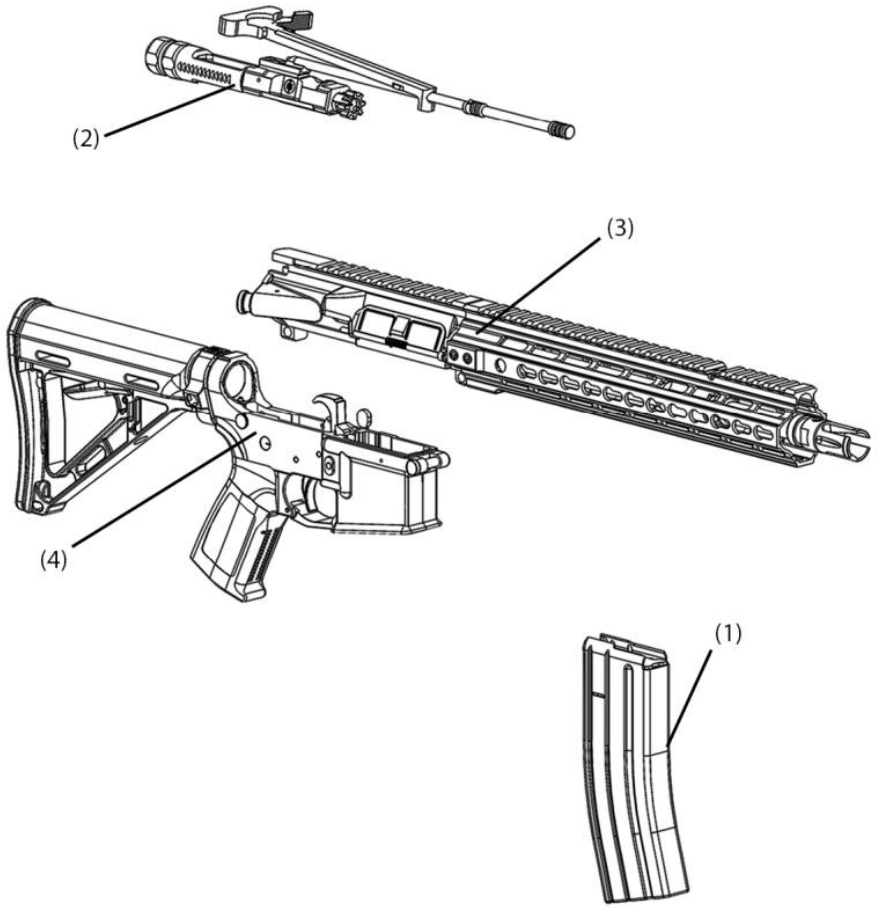
This task covers disassembly

INITIAL SETUP:

Equipment Conditions
MK1 Series rifle assembled

General Safety Instructions
Before starting an inspection, clear the weapon. Do not keep live ammunition near your work area.
To avoid injury to eyes safety glasses should be worn at all times.
Below armorer level maintenance, do not interchange bolt assemblies from one weapon to another.

a. DISASSEMBLY



a. Remove Magazine (1), bolt carrier/charging handle assembly (2), upper receiver and barrel assembly (3) from lower receiver and buttstock assembly (4).

2-13 BOLT CARRIER ASSEMBLY

This task covers:

- **a. Disassembly**
- **b. Cleaning**
- **c. Inspection/Repair**
- **d. Lubrication**
- **e. Reassembly**

INITIAL SETUP:

Tools

Small Arms Repairman Kit (Appendix A, Item 5)

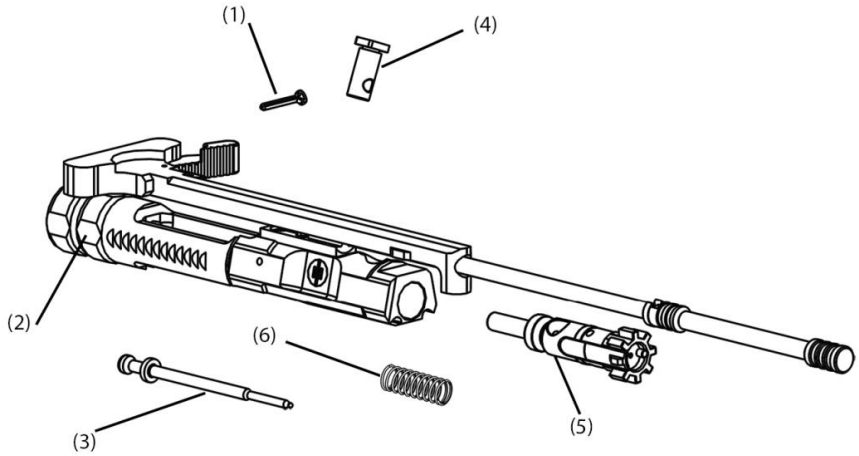
Equipment Conditions

Bolt carrier assembly removed

General Safety Instructions

Bolt cam pin must be installed prior to firing to prevent injury or death to personnel.

Below armorer level maintenance, do not interchange bolt assemblies from one weapon to another.



a. DISASSEMBLY

CAUTION

Do not spread or close legs of firing pin retaining pin (1)

1. Remove firing pin retaining pin (1). Tilt bolt carrier/charging handle assembly (2) and catch firing pin (3) as it drops out.
2. Rotate bolt cam pin (4) one quarter turn and lift straight up to remove.
3. Remove bolt assembly (5) from key and bolt carrier assembly (2). Remove spring (6) from bolt.
4. Remove piston head by turning piston until opening is at the 3 or 9 O'clock position. Move piston laterally from operating rod.
5. Slide charging handle forward and off of the operating rod to clean or replace.

NOTE

For disassembly of bolt assembly (5), see page 46

2-13.1 BOLT CARRIER ASSEMBLY (CONT)

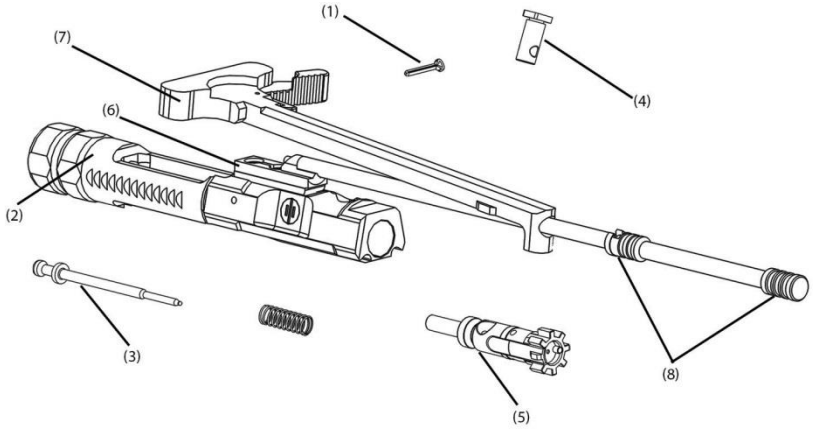
b. CLEANING

Clean the bolt and bolt carrier assembly in accordance with your user manual.

c. INSPECTION/REPAIR

1. Inspect bolt assembly (5) as follows:

   Insert bolt (5) into bolt carrier assembly (2). Bolt (5) should rotate freely.



2. Inspect carrier key (6) for dents, cracks, or looseness. If cracked or loose, repair or replace as necessary.

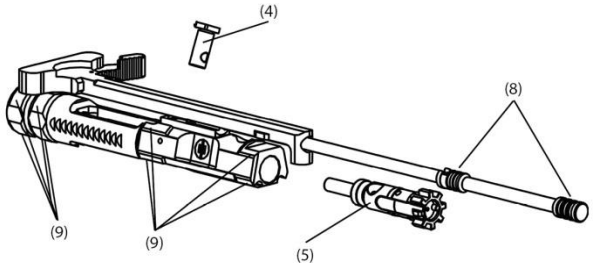
3. Inspect firing pin retaining pin (1) and bolt cam pin (4) for cracks, damage, or excessive wear. Replace if unserviceable.

4. Inspect firing pin (3) for damage. If tip is chipped, replace as necessary.

5. Inspect bolt carrier assembly (2) for damage or wear. If unserviceable, repair or replace as necessary.

6. Inspect charging handle (7) for cracks or damage. Wear marks in on the charging handle is normal as long as it does not diminish the structural integrity.

7. Inspect piston head (8) for cracks or damage. Pay close attention to the area at the back of the piston where it is held onto the operating rod.



d. LUBRICATION

A small amount of lubrication is recommended on the enlarged contact points of the bolt carrier assembly (9) as well as on bearing surfaces of the bolt (3) and the cam pin (4). Under no circumstances should you lubricate the piston heads (8). Doing so can cause excessive buildup on the piston heads and in turn will cause weapon malfunctions.

2-13.2 BOLT CARRIER ASSEMBLY (CONT)

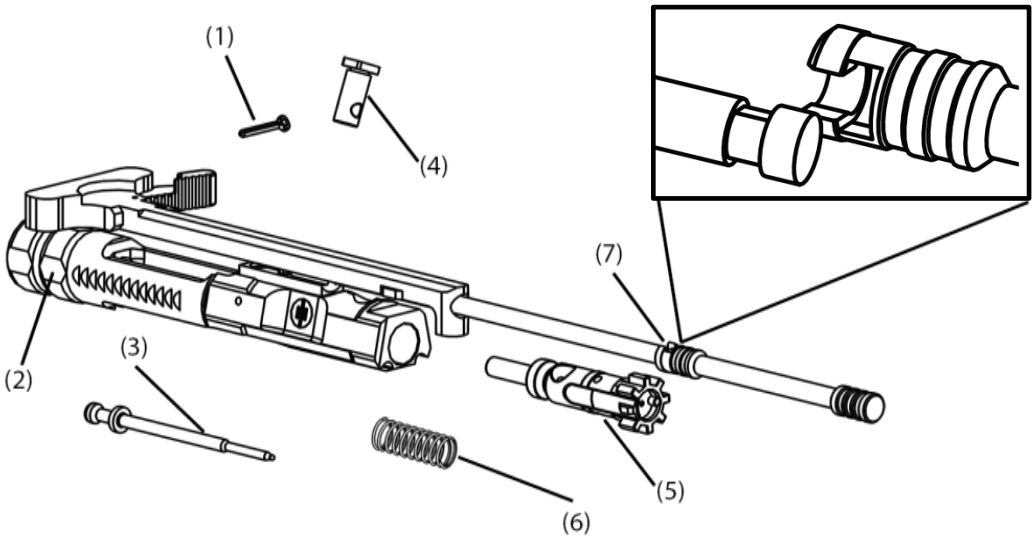
e. REASSEMBLY

WARNING

Do not interchange bolt assemblies from one rifle to another Doing so may result In Injury, or death of personnel.

Bolt cam pin must be installed or a catastrophic failure will occur while firing the first round. If the bolt cam pin is not Installed, Injury to, or death of, personnel may result.

1. Reinstall spring (6) on rear tail portion of the bolt (5), insert bolt (5) back into the front of the carrier (2).
2. Install bolt cam pin (4) and rotate one quarter turn
3. Hold bolt carrier assembly (2) with bolt assembly (5) down and drop firing pin (3) in through the back of the carrier (2).
4. Install firing pin retaining pin (1) from left side only to ensure proper installation check for proper installation by holding bolt carrier assembly (2) with bolt assembly (5) up, then attempt to shake out firing pin.
5. To replace piston head install charging handle, by sliding op-rod through the hole located on the front of the charging handle.
6. Install piston by sliding piston (7) onto operating rod as shown.
7. Reassemble rifle. (refer to page 54)



2-14 BOLT ASSEMBLY

This task covers:

a. Removal
b. Cleaning
c. Inspection
d. Lubrication
e. Reassembly

INITIAL SETUP:

Tools

Small Arms Repairman Kit (Appendix A, Item 5)

Equipment Conditions

Bolt assembly removed

General Safety Instructions

Do not Interchange bolt assemblies from one rifle to another. Doing so may result in injury to, or death of, personnel.

To avoid injury to your eyes, use care when removing and installing spring-loaded parts.

a. DISASSEMBLY

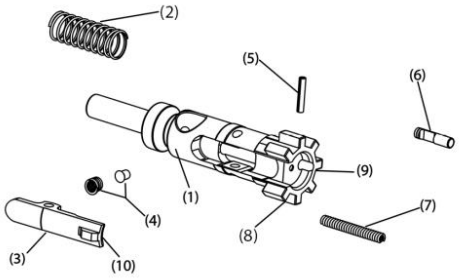
NOTE

Do not separate cartridge extractor and extractor spring assembly unless replacement of either or both are required

Do not remove the rubber Insert from the extractor spring assembly

1. Push out extractor pin (2) and remove cartridge extractor (3) and extractor spring assembly (4) as a unit

2. If required, twist extractor spring assembly (4) counterclockwise to remove from cartridge extractor (3).



CAUTION

Be sure to use vise jaw protective caps

3. Hold bolt body In vise and remove spring pin (5) using 1/16 inch punch and hammer

4. Remove punch, be sure to catch cartridge ejector (6) and ejector spring (7) to prevent loss

b. CLEANING

CAUTION

Do not distort extractor spring assembly during cleaning.
Clean all Items. Remove carbon deposits.

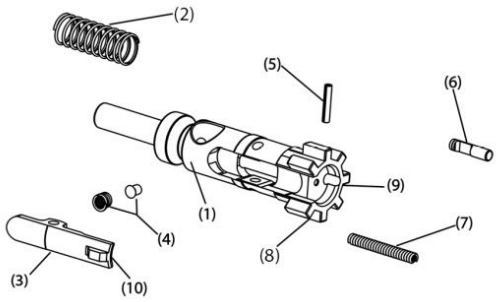
2-14.1 BOLT ASSEMBLY (CONT)

c. INSPECTION/REPAIR

1. Inspect for cracks or damage, especially around locking lugs (9). Replace any components that are damaged, cracked or have excessive wear.

2. Inspect the extractor (3), extractor spring assembly (4), and extractor pin (2) for cracks, breaks, chips, and other damage. Pay close attention to cartridge extractor lip (10). If damaged, replace.

3. Inspect cartridge ejector (6) and ejector spring (7). Replace as necessary.



d. LUBRICATION

A small amount of lubrication is recommended on the bearing surfaces of the bolt (1). Over-lubrication is not recommended.

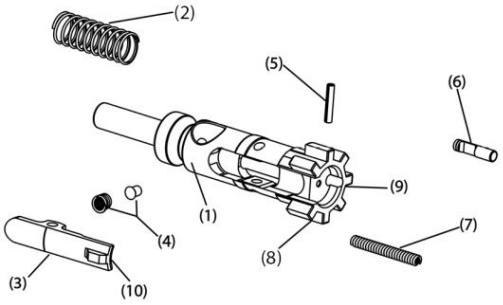
e. REASSEMBLY

WARNING

To avoid Injury to your eyes, use care when removing and Installing spring loaded parts.

CAUTION

Be sure to use vise jaw protective caps



1.
2. Place bolt body (1) in a vise and start spring pin (5) in hole.

3. Install ejector spring (7) and cartridge ejector (6). Align groove on cartridge ejector (6) so that spring pin (5) can be installed.

4. Compress and hold ejector spring (7) and cartridge ejector (6) in place with a 3/8 inch punch.

5. Using hammer and 1/16 Inch punch, complete installation of spring pin (5) so that the ends are flush with the outside of bolt body (1).

NOTE

Do not disassemble rubber Insert from extractor spring assembly.

6. If removed, Insert large end of extractor spring assembly (4) into cartridge extractor (3) and seat by pushing and turning clockwise.

7. Position cartridge extractor (3) and extractor spring assembly (4) on bolt body (1).

8. Compress extractor spring assembly (4) and cartridge extractor (3) to align holes.

9. Install extractor pin (2) by hand.

10. Reassemble rifle. (refer to page 54)

2-15 CHARGING HANDLE ASSEMBLY

This task covers:

a. Disassembly
b. Cleaning
c. Inspection/Repair
d. Lubrication
e. Reassembly

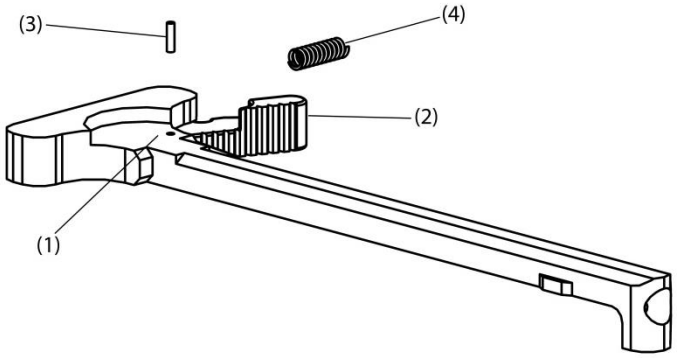
INITIAL SETUP

Tools

Small Arms Repairman Kit (Appendix A, Item 5)

Equipment Conditions

Charging handle assembly removed



a. DISASSEMBLY

NOTE

To avoid injury to eyes, use care when removing and installing spring-loaded parts.

1. Remove spring pin (3) from charging handle (1) using a hammer and a 1/16 inch punch.
2. As punch is withdrawn, catch charging handle latch (2) and helical spring (4) to prevent loss.

b. CLEANING

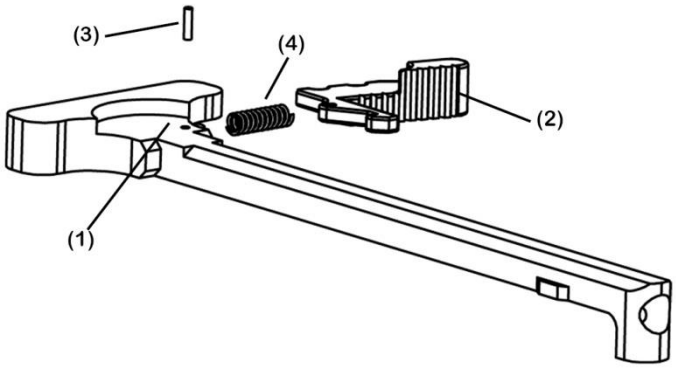
Clean all exterior surfaces of the charging handle as well as the groove in the bottom of the charging handle.

c. INSPECTION/REPAIR

Inspect all items for breaks, cracks, or damage. Replace unserviceable items.

d. LUBRICATION

Lightly lubricate all items.



e. REASSEMBLY

1. Position helical spring (4) and charging handle latch (2) in charging handle (1). Align holes in position
2. Install spring pin (3) using a small hammer. Make sure spring pin is flush.
3. Reassemble rifle, (refer to page 54)

2-16 UPPER RECIEVER AND BARREL ASSEMBLY

This task covers:

- **a. Disassembly**
- **b. Cleaning**
- **c. Inspection**
- **d. Repair**
- **e. Lubrication**
- **f. Reassembly**

INITIAL SETUP

Tools

Small Arms Repairman Kit (Appendix A, Item 5)
Upper Receiver Action Block (Appendix A, Item 7)

Materials/Parts

Lubricants

Equipment Conditions

Upper receiver and barrel assembly removed from lower receiver

General Safety Instructions

To avoid injury to your eyes, use care when removing and installing spring loaded parts.

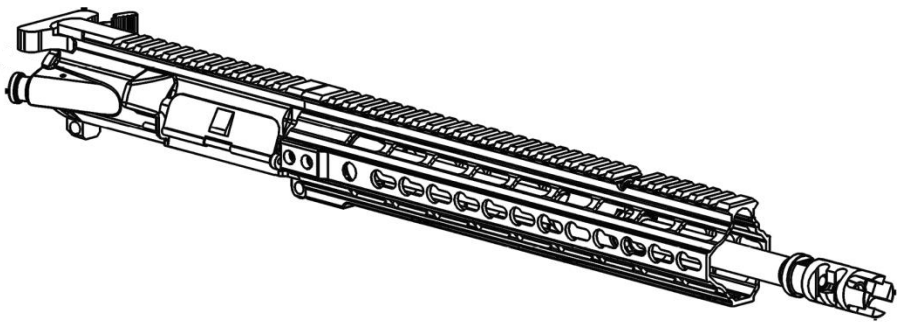
a. DISASSEMBLY

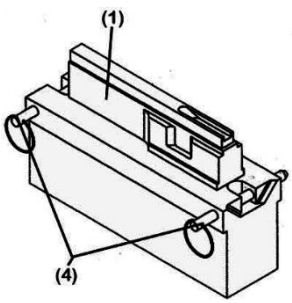
NOTE

The key mod rail should not be removed as a part of routine maintenance. You should only remove the key mod rail to repair or to replace the rail or related components.

<u>If not replacing any components, clean in accordance with the user manual and skip to section C, item 1.</u>

1. Secure Upper Receiver Action Block (1) in a vise. Remove bolt carrier group and charging handle (2) and secure upper receiver (3) to Action Block (1) using the two supplied cross pins (4).
2. Using a 5/32 Allen wrench, remove the 6 screws (5) from the rear portion of the key mod rail.
3. Pull the key mod rail off the muzzle end of the upper receiver.



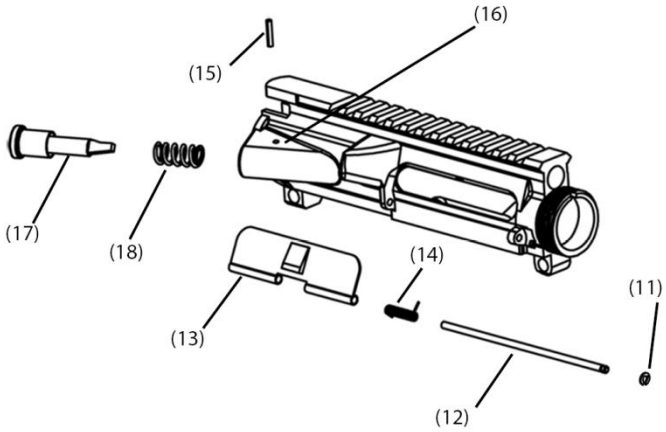


2-16.1 UPPER RECEIVER AND BARREL ASSEMBLY (CONT)

4. Remove retaining ring (11) and slide headless grooved pin (12) out to the rear.

5. Catch cover spring (14) and ejection port cover (13) to prevent loss as headless grooved pin (12) is withdrawn.

6. Tap the forward assist spring pin (15) out of the upper receiver (16) from top to bottom using a 1/16 inch punch and hammer. Catch the forward assist (17) and spring (18) to prevent loss.



b. CLEANING

Clean all items. (refer to user manual)

c. INSPECTION

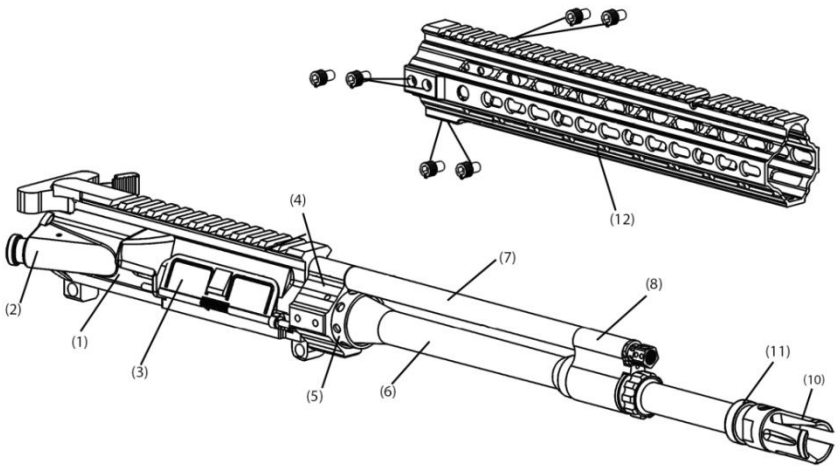
1. Inspect upper receiver (1) for breaks, cracks, or damage to the top rail that would prevent the attachment of accessories onto the Picatinny rail. Replace as necessary.

2. Inspect forward assist assembly (2). Ensure that the forward assist fully depresses and returns without binding. Replace defective components.

3. Inspect ejection port cover (3). Ensure the ejection port cover closes and latches as well as springs open when pushed open by either your fingers from the inside of the receiver or from the movement of the bolt carrier group. Replace defective components.

4. Inspect trunnion (4) and barrel nut (5) for cracks, or damage. Replace as needed.

5. Inspect barrel (6) for pits in bore, burrs, broken or worn locking lugs, and/or surface cracks and/or defects.



a. Pits no wider than a land or groove and 3/8 inch (0.953 cm) or less in length are allowable in the bore.
b. Uniformly fine pits in a densely pitted area of the bore are allowed.
c. Lands that appear dark due to coating of gliding metal from projectiles are allowed.
d. Striping of the lands and groves shall not be cause for rejection unless determined by use of barrel erosion gauge.
e. For pits other than mentioned above, broken or burred locking lugs, or surface cracks, barrel should be replaced.

2-16.2 UPPER RECEIVER AND BARREL ASSEMBLY (CONT)

6. Inspect bore for ringing or bulges in the barrel. Bores that are ringed or sufficiently bulged are cause for rejection and the barrel should be replaced.

7. Inspect chamber for pitting. Fine pits, or fine pits in a densely pitted area, are allowable. Pits 1/8 inch (0.318 cm) in length are cause for rejection and barrel should be replaced.

8. Inspect piston tube (7) for cracks, deformation or gas leakage between piston tube and gas block (8). Replace as necessary.

9. Inspect gas block (8) for cracks. Check seal around the barrel for evidence of gas leakage. A minimal amount of leakage is acceptable as long as short recoil does not result. Gas blocks found to have cracks or excessive leakage should be replaced.

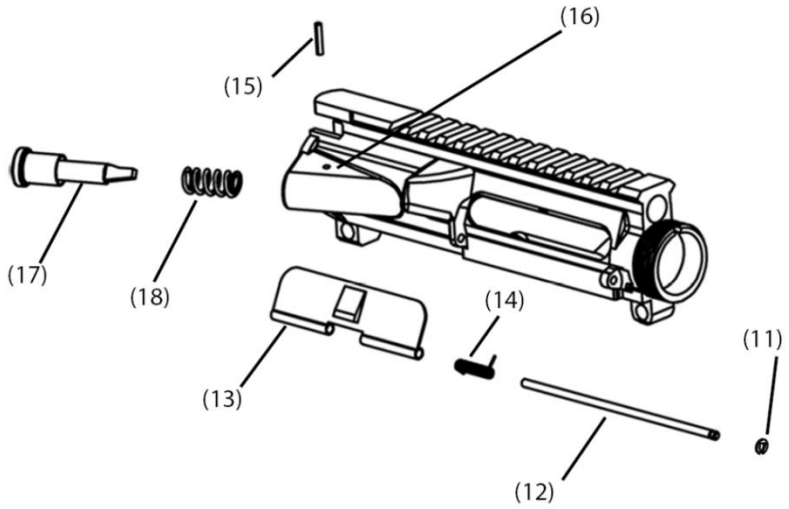
10. Check muzzle device (10) for looseness on barrel. A shim set (11) is used to properly align the muzzle device. Typically, if a logo is present, proper orientation is achieved when the logo is straight up at top dead center (TDC). If loose or out of alignment repair or replace as needed.

11. Inspect top rail, of the key mod rail (12) for damage that would prevent the attachment of accessories onto the Picatinny rail. Replace as necessary.

12. Inspect the outside of the rail (13) for damage to that would prevent the attachment of the key mod rail sections, replace as necessary.

d. REPAIR

1. Repair or replace all unserviceable parts.



e. LUBRICATION

1. Lightly lubricate all items. Do not over lubricate, this can cause the action to become sticky, allowing dust and debris to collect.

f. REASSEMBLY

NOTE

If components were not replaced and the upper was not disassembled, skip to the next section.

1. If ejection port cover assembly was previously disassembled, position ejection port cover (13) and helical spring (14) on edge of receiver (16) with short leg of helical spring to the rear on the inside of the ejection port cover.

NOTE

Long leg of helical spring (14) must be position and pretensioned before the headless groove pin (12) is installed

2. Hold helical spring (14) with the short leg pointing up and turn long leg one half turn (180 degrees). If spring spreads or bows, you are turning it the wrong direction.

2-16.3 UPPER RECEIVER AND BARREL ASSEMBLY (CONT)

(Referring to illustration on Page 51)

3. Position long leg of helical spring (14) against ejection port cover (13). Hold helical spring and election port cover in position and install headless grooved pin (12). Check for proper spring tension and function before installing retaining ring (11).

4. If forward assist assembly was previously disassembled, place forward assist spring (18) into the upper receiver followed by the forward assist assembly (17).

5. Depress the forward assist plunger (17) until the groove is lined up with the hole in the receiver.

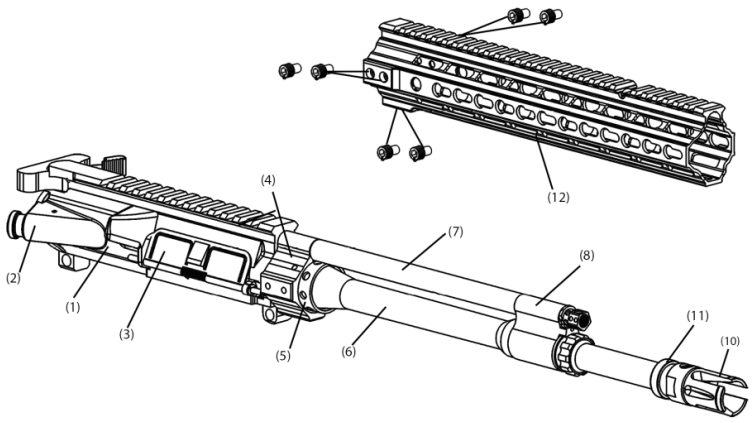
6. Place the forward assist spring pin (15) into the hole on the receiver (16) and tap in with a small hammer until flush.

(End Reference to Illustration on Page 51)

7. Slide the key mod rail (12) onto the trunnion (4) ensuring that the rail lines up with the guides on the trunnion.

8. Place the shim set or crush washer (11) over the muzzle and thread the muzzle device on by hand. Tighten with a wrench until properly aligned. If a logo is present, proper orientation is achieved when the logo is straight up at top dead center (TDC).

9. Slide key mod rail with the screw hole portion over muzzle. Completely seat the rail against the upper receiver. Install six Allen screws using a calibrated torque wrench to 60 inch pounds. While tightening screws ensure the top of the rail is not in contact with the rail.



2-17 LOWER RECEIVER AND BUTTSTOCK ASSEMBLY

This task covers:

- **a. Disassembly**
- **b. Cleaning**
- **c. Inspection**
- **d. Repair**
- **e. Lubrication**
- **f. Reassembly**

INITIAL SETUP

Tools

Small Arms Repairman Kit (Appendix A, Item 5)
Piston Pin Installation/Removal Tool (Appendix A, Item 1)
Upper Receiver Action Block (Appendix A, Item 7)

Materials/Parts

Lubricants

Equipment Conditions

Lower receiver and buttstock assembly removed

2-17.1 LOWER RECEIVER AND BUTTSTOCK ASSEMBLY (CONT)

a. DISASSEMBLY

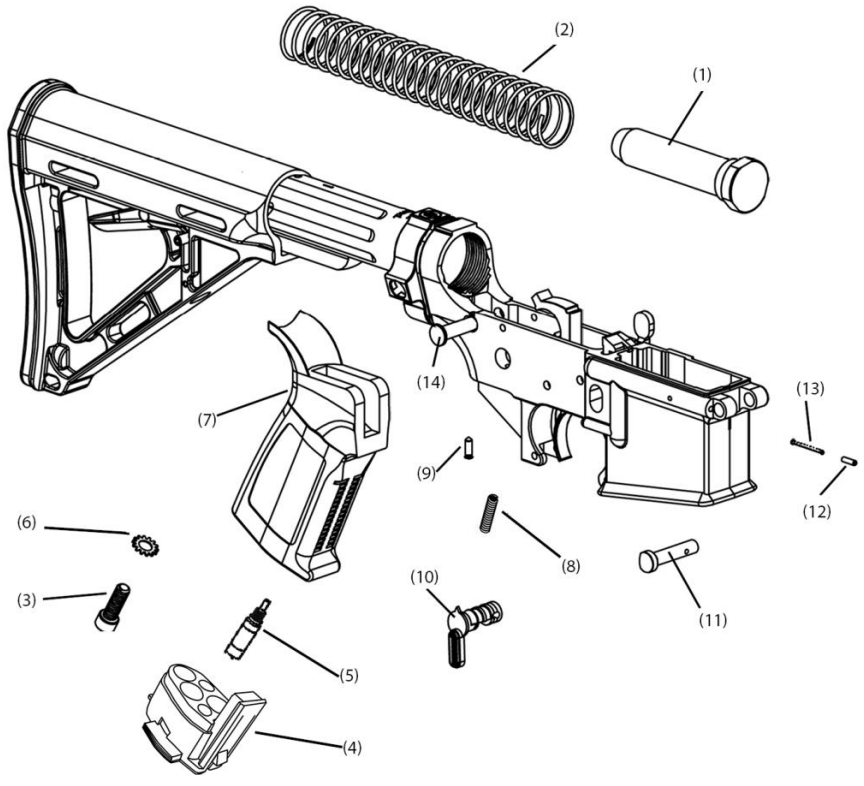
2. Remove screw (3) and lock washer (6).
3. Carefully remove pistol grip (7) and catch helical spring (4) and safety detent (5) to prevent loss.
4. Extend buttstock assembly.
5. Pull down sharply on lock release lever (6) and pull stock rearward and off of the buffer tube (1).
6. Using the Pivot Pin Removal Tool, depress pivot pin detent (9). Turn pivot pin (11) a quarter turn, slide tool out of the way and remove the pivot pin.
7. Use your hand to cover and catch the pivot pin detent (9) and spring (10) upon removal to avoid loss.
8. Push the buffer retaining pin (14) down to allow the buffer (12) and buffer spring (13) to move forward. Remove buffer and buffer spring.

b. CLEANING

Clean all items. Remove all carbon deposits.

c. INSPECTION

1. Inspect buffer assembly (12).
2. If cracked, replace.
3. Check free length of buffer spring (13). The free length must be between a minimum of 10 1/16 inches to maximum of 11 1/4 inches. If not, replace. Do not attempt to adjust the length by stretching the buffer spring.
4. Inspect lower receiver (18) without further disassembly.
5. Inspect for missing or damaged parts.. Inspect finish of lower receiver for shiny spots.



2-17.2 LOWER RECEIVER AND BUTTSTOCK ASSEMBLY (CONT)

d. REPAIR

1. Upon completion of inspection, repair or replace items as needed. Do not exceed the level of maintenance authorized by your agency or unit.

e. LUBRICATION

1. Lightly lubricate all metal components. Do not over lubricate.

f. REASSEMBLY

1. Press buffer spring (13) and buffer assembly (12) in to the buffer tube until buffer retaining pin (14) engages.

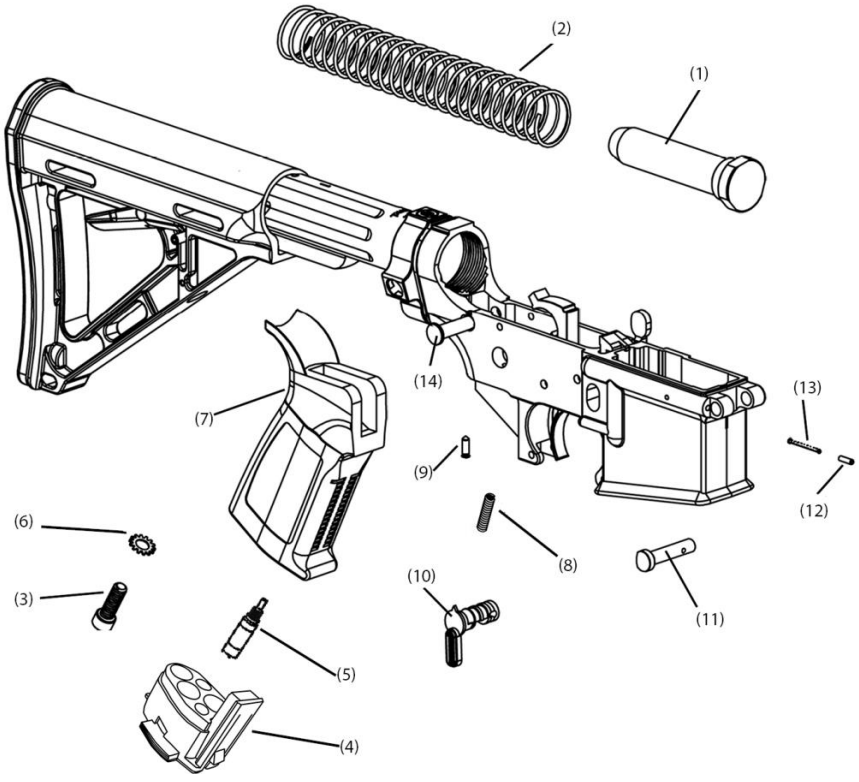
2. Install the spring (10) and pivot pin detent (9) and hold down with Pivot Pin Installation Tool.

3. Position the pivot pin (11) so that the groove in the bottom faces toward the bottom of the magazine well and slide into place ensuring the detent pin does not come out. Rotate pivot pin until a click is heard signaling the detent is in the groove.

4. Slide buttstock (7) over buffer tube (8). Pull down on lock release lever (6) and slide stock all the way forward.

5. Install safety detent (5) and helical spring (4) into the bottom of the receiver.

6. Carefully install pistol grip (3) and secure in place with lock washer (2) and screw (1).



2-18 MAJOR COMPONENTS OF THE MK1 SERIES RIFLES

This task covers:

a. Reassembly
b. Inspection
c. Stowage

INITIAL SETUP

Equipment Conditions
Rifle disassembled into major components.

General Safety Instructions
To avoid injury to your eyes, use care when removing and installing spring loaded parts.

a. REASSEMBLY

1. Slide the charging handle all the way forward until it stops against the carrier key portion of the operating rod.
2. Guide the piston operating rod toward rear of the piston tube.
3. Slide the lug portion of the charging handle into the receiver groove.
4. Place the upper (3) and lower receiver (4) together
5. Push the take-down pins in place. It is easiest to do the front pin first and the rear pin second.

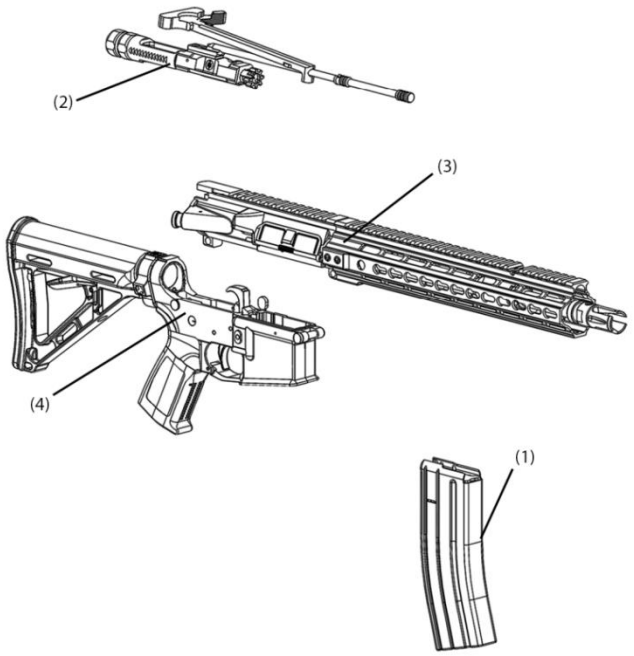
b. INSPECTION

Perform the following function checks on assembled weapon.

1. Remove magazine if installed. Pull charging handle assembly to rear. Check that chamber is clear. Let bolt and bolt carrier close. Do not pull trigger. Leave hammer in cocked position.

WARNING
If rifle fails any of the following tests, continued use of the rifle could result in injury to, or death of, personnel.

2. Place selector lever in SAFE position and pull trigger. Hammer should not fall.
3. Place selector lever in SEMI position. Pull trigger. Hammer should fall.



MK1S (Select Fire Models) ONLY

4. Place selector lever in AUTO position. Charge weapon and pull trigger. Hammer should fall.

5. Hold trigger to the rear, charge weapon and release trigger. Pull trigger. Hammer should not fall. AUTO sear should have released hammer while holding trigger in the squeezed position before releasing and resqueezing the trigger.

6. With hammer in forward position, attempt to place the selector lever in the SAFE position. If selector lever can be placed on SAFE, replace fire control group components as necessary.

c. STOWAGE

Prior to stowing weapons in arms room, perform the following functions.

1. Clear. (refer to user manual)

2. Place selector lever in SEMI position.

3. Pull trigger. Hammer should fall.

4. Close ejection port (dust) cover.

5. Place weapon in rack.